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Arvin	5210, 5211, 5212 (Ch. TE315, -1, -2, -3, -4, -5, -5A, -6) Tel. Rec., Prod. Chg. Bul. 50	184-1
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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET #151

Arvin Models 5210, 5211, 5212 using Ch. TE315 have the following changes incorporated under chassis coded TE-315-1, -2, -3 and -4.

Ch. TE315-1

R113 was changed to 220K and two 220K resistor was added in series with R113.

Ch. TE315-2

HORIZONTAL DRIFT

R105 was changed to 47K to increase the range of the horizontal hold control (R3) and minimizes the oscillator drift beyond the range of the control.

SOUND QUIETING AND GAIN

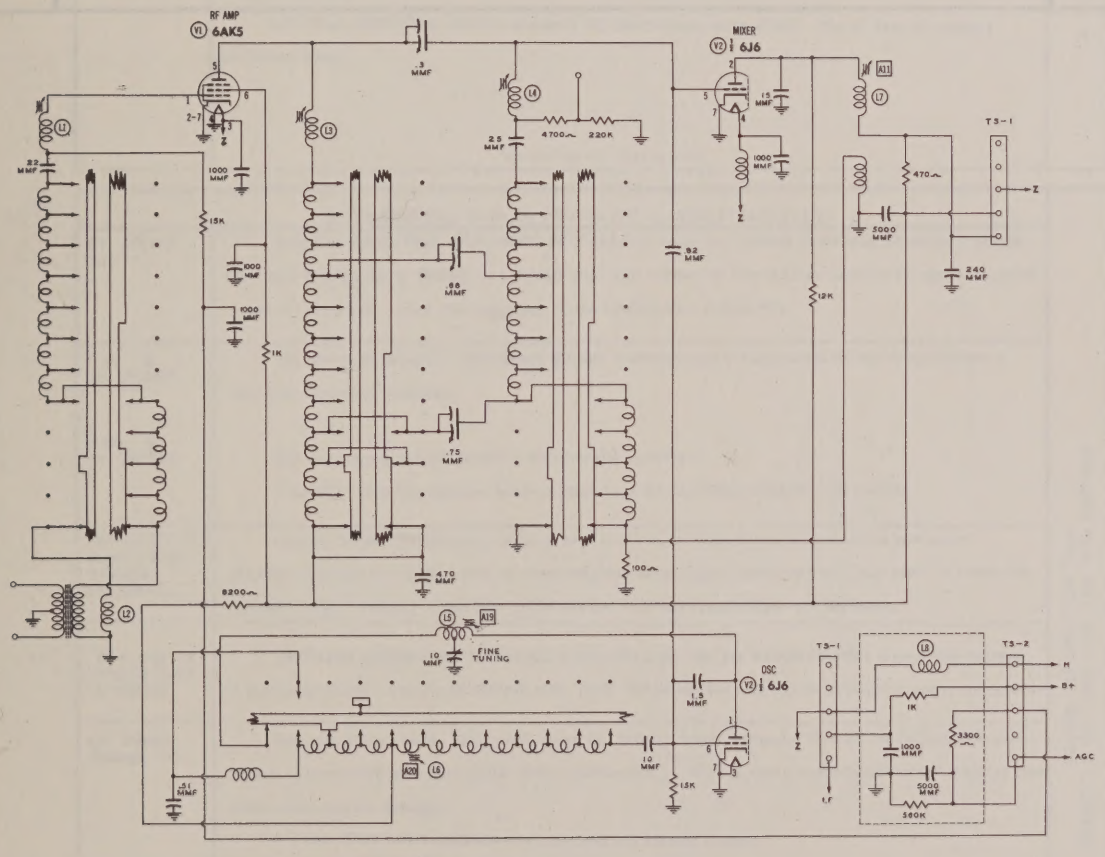
C-29 was changed to 8.2MMFD to increase sound gain and also better quieting at the discriminator.

TWEET OR SQUEAL IN SOUND

A 5000MMFD disc capacitor was added between pin #7 of V10 and ground (Note: Was removed on Ch. 315-4).

TUNER ASSEMBLY AE24737-3

A new tuner part #AE24737-3 is used in Ch. TE-315-2 and later productions. A partial schematic of the new tuner is shown below.



ARVIN MODELS 5210, 5211, 5212 (Ch. TE-315, -1, -2, -3, -4)

PRODUCTION CHANGES
BULLETIN 50

CONTINUED ON NEXT PAGE

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Ch. TE315-3	IF INTERFERENCE A IF Trap C25255 was added to eliminate RF interference below 45MC.
Ch. TE315-4	TWEET OR SQUEAL IN SOUND The 5000 MMFD capacitor added on Ch. TE315-2 was removed. A 1500Ω ½ watt resistor was added between the -13 volt line and pin #3 of V8 (6AC7). A .1MFD, 200V capacitor was added across R114. AUTOMATIC VERTICAL RETRACE BLANKING The B+ is removed from the red lead of the vertical output choke (T4) and tied to green lead (center tap). A .022MFD capacitor was connected between the red and green leads of T4. A 220K ½ watt resistor was added between the brightness control (R4) and pin #2 of V25 (21AP4). A .1MFD 1000V. capacitor and a .1MFD 400V. capacitor, in series, are connected between pin #2 of V25 (21AP4) and the red lead of vertical output choke (T4). The .1MFD 400V. is connected to pin #2 of V25. An 8200Ω ½ watt resistor is connected between ground and the junction of the two .1MFD capacitors.

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET #142

ARVIN MODELS 5170CB, 5171TM, 5172CB, CM (Ch. TE-302, -1, -2, -3, -4, -5, -5A, -6)

Ch. TE-302-1	Arvin Models 5170CB, CM, 5171TM, 5172CB, CM using Ch. TE-302 have the following changes on coded chassis TE-302-1, -2, -3, -4, -5, -6. L13 was changed to part #C22500-19. L16 was changed to part #22500-19 and the resistor that L16 was wound on chan ged to 18K. R33 was changed to 120Ω. A 27 ohm cathode resistor and .022MFD bypass was added between R38 and the -11.4 volts line.
Ch. TE302-2	R85 was changed to 1.6 Meg. R20 was changed to 15K. A 5MMFD capacitor was added between Pin #7 of V3 and ground. A 5000MMFD capacitor was added in the IF Input lead to V3. (White lead of tuner). A new tuner was used in production coded TE-302-2 or later. Tuner schematic shown with Prod. Chg. on TE315-4.
Ch. TE302-3	HORIZ: DRIFT R114 was changed to 47K to increase the hold range of R3. (Horiz. Hold Control) and to minimize the oscillator drift. SOUND QUIETING AND GAIN For better quieting of the discriminator and sound gain a 8.2MMF capacitor was added between converter coil (L9) and ground. TWEET OR SQUEAL IN SOUND A 5000MMF disc capacitor is added between pin #7 of V9 and ground.
Ch. TE302-4	IF INTERFERENCE A IF Trap C25255 was added to eliminate RF Interference below 45MC. The IF Trap is mounted just back of tuner.

(Continued on reverse side)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER #6 IN SET #148

EMERSON 676F, 681F, 686F, 687F, 696 (Ch. 120143B) 686L, 687L, 696L (Ch. 120142B)

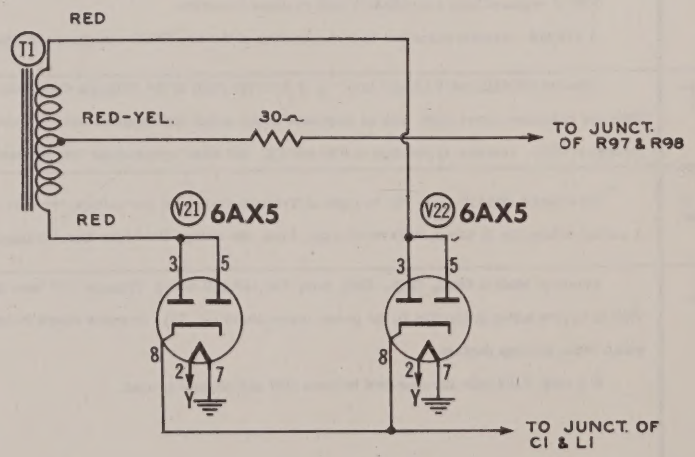
Ch. 120143B Suffix #1	Emerson Models 676F, 681F, 686F, 687F and 696F using Ch. 120143B coded with the suffix #1 outside the codes triangle has a 68MMF or a 82MMF capacitor across the link of L7 to increase its bandwidth, tuner wires are reversed when this capacitor is used (white wire to blue dot).
Code E Ch. 120143B Code H Ch. 120142B	The above set using Ch. 120142B and 120143B coded triangle E incorporate the following changes to minimize horizontal foldover. R88 is replaced with two 100KΩ ½ watt resistor in series. A 25MMF ceramic capacitor between junction of the two 100KΩ resistors and chassis.
"Q" or "K" to Right of Code Triangle Ch. 120143B	Chassis 120143B coded capital letter Q or K to the right of the Triangle Code has a new tuner. This low radiation turret tuner with an improved noise factor has an additional blue lead which is connected through a 470Ω resistor to junction of R99 and C2. All other connections are the same.
"Z" to right of Triangle Code. Ch. 120143B	On Chassis 120143B Code "Z" to right of Triangle Code the low voltage rectifier circuit was changed A partial schematic is shown on reverse side. Also, the change list under Code Triangle E was incorporated.
Ch. 120142B Triangle "G"	Emerson Models 686L, 687L, 696L using Ch. 120142B coded Triangle "G" have the following changes. This is to give added protection to the power transformer, (T1) in cases where failure of the rectifier tube would cause serious damage. A ½ amp. 250V fuse is connected between R98 and chassis ground.

(Continues on reverse side)

ARVIN MODELS 5170CB, 5171TM, 5172CB, CM (Ch. TE-302, -1, -2, -3, -4, -5, -5A, -6)

Ch. TE302-5	TWEET OR SQUEAL IN SOUND The 5000MMF disc capacitor added in TE-302-3 is removed. A 1500Ω ½ watt resistor was added between the -13 volts line and pin #3 of V8 (6AC7). A .1MFD 200V. capacitor was added across R112.
Ch. TE302-5A	Ch. TE302-5A did not use only a few of the change list above. R20 was changed back to 18K. L9 uses link coupling. Tuner was the same as TE302-1 chassis.
Ch. TE302-6	AUTOMATIC VERTICAL RETRACE BLANKING The B+ is removed from the red lead of the vertical output choke (T4) and tied to green lead (Center tap). A .022MFD capacitor was connected between the red and green leads of T4. A 220K ½ watt resistor was added between the Brightness control (R4) and Pin #2 of V25 (21AP4). A .1MFD 1000 V. capacitor and a .1MFD 400V. capacitor, in series, are connected between Pin #2 of V25 (21AP4) and the red lead of Vertical output choke (T4). The .1MFD 400V is connected to pin #2 of V25. An 8200Ω ½ watt resistor is connected between ground and the junction of the two .1MFD capacitors.

EMERSON 676F, 681F, 686F, 687F, 696 (Ch. 120143B)
686L, 687L, 696L (Ch. 120142B)



LOW VOLTAGE RECTIFIER CIRCUIT -TRIANGLE "Z" CODE

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DENVER, COLORADO

AIRCASTLE
MODEL 610.S500

AIRCASTLE
MODEL 610.S500

TRADE NAME	Aircastle Model 610.S500 (For 1950-1951 Studebaker Automobiles)
SUPPLIER	Spiegel, Inc., 1061 W. 35th.St., Chicago 9, Ill.
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 5.8 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	538-1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2) Low side to chassis.	455 KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	"	"	1600 KC	"	"	A5	Adjust for maximum output. If A5 shows insufficient range, set in middle of range and adjust trimmer on opposite end of same section of tuning gang.
3.	Fig. 1	Thru dummy to antenna receptacle	600 KC	Tune to 600 KC signal	"	A6, A7	"
4.	"	"	1400 KC	Tune to 1400 KC signal	"	A8, A9	"

Turn tuning gang fully open and set pointer 3/8" from right hand end of dial background plate.

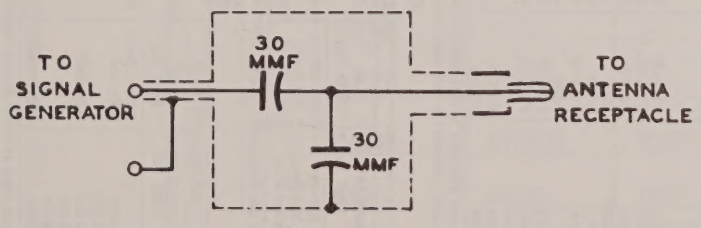

FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp	6AT6	6AT6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■20	350	CE-86	AFH3-107		UP2235C		FP345.8	TVL-3678	
B	▲20	350								
C	20	25								
C2	.05	200	C207	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.05	200	C207	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C4	.05	200	C207	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	100		CC200	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C6	220			SI220	D6-221	TM5T2	GP2K-221	UC-5322	5GA-T22	Note 1
C7	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	Note 2
C8	220			SI220	D6-221	TM5T2	GP2K-221	UC-5322	5GA-T22	Note 1
C9	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C10	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C11	.008	1600	C205			PTE16D8		PT1628	MB-D8	
C12	.5	100	C209	P185-5		MP2P5			68P20	
C13	.5	100	C209	P185-5		MP2P5			68P20	

Note 1. Some Models use 200MMF in this application (Part #CC201)
Note 2. Some Models use .002MFD in this application (Part #C203)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750KΩ	½	RV-57	Q13-137	AG-79-Z	B-70-S	U-51	Volume - See Note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

Note: Some Models may use Alternate Control (Part #RV-570)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	1.2Meg	½		BTS-1.2Meg	Note 1
R3	330Ω	½	R303	BTS-330	
R4	20KΩ	½	R306		
R5	1500Ω	½	R314	BTS-1500	
R6	20KΩ	2	R313		
R7	2Meg	½	R310		
R8	10Meg	½	R311	BTS-10Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R9	250KΩ	½	R307		
R10	500KΩ	½	R308		
R11	330Ω	½	R303	BTS-330	
R12	1000Ω	1	R312	BTA-1000	
R13	120Ω	½		BTS-120	Note 2
R14	120Ω	½		BTS-120	Note 2

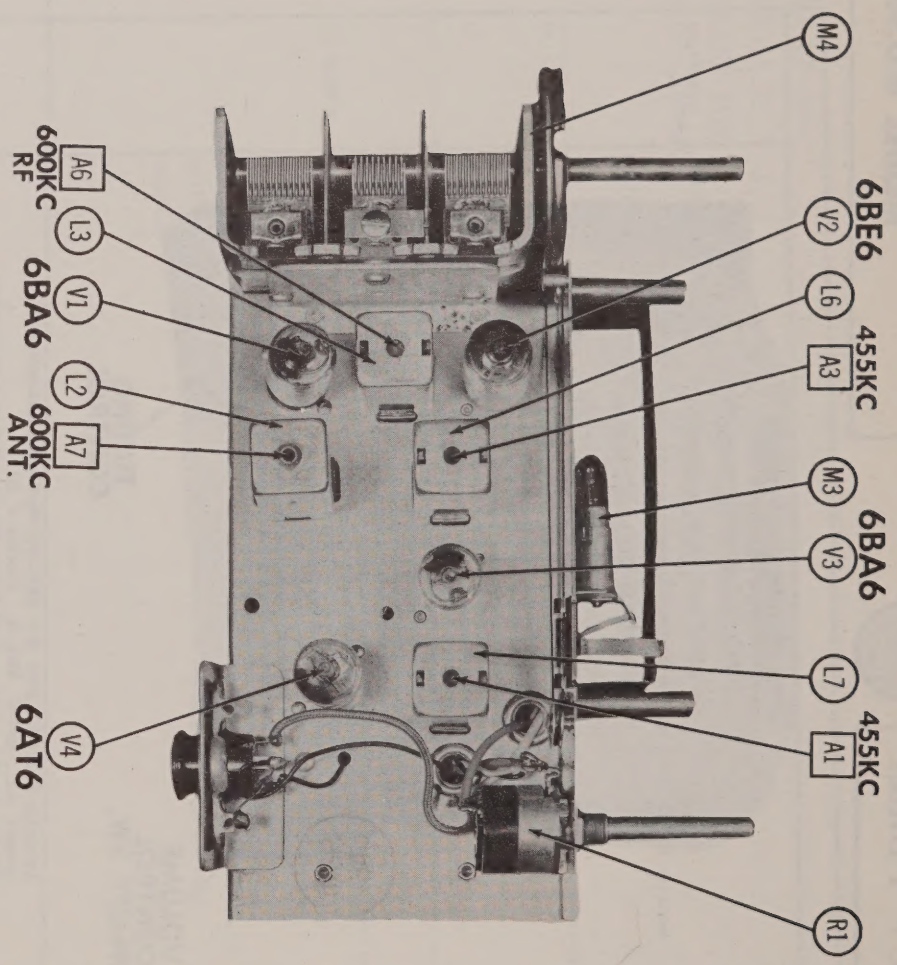
Note 1. Some Models use a 1Meg resistor in this application.
Note 2. Some Models use a 100Ω resistor in this application.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC 5.8ADC	430VCT .046ADC			TV-100 318V-2 ①		P-2971	VT-1 ②	V-16K

① Alternate trans.
② Drill new mtg. holes

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	2.7KΩ	3.1Ω	260Ω	.5Ω	Part of Spkr.	A-3332 ①	A-3025 ①	RO-2 ①	S-1X ①	① Bend mtg. tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.1Ω	PM-710	ST-105 Mod. P5-1	5A15	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AIRCASTLE PART No.	MERIT PART No.	
L1	Noise Eliminator	23Ω		L200		Includes 10MMF Capacitor
L2	Ant. Coil	22Ω	6.5Ω	15053 *		* Alternate part #57FB-3
L3	RF Coil	100Ω	6.5Ω	15054 †		† Alternate part #57FB- 4
L4	Osc. Coil	8.7Ω		L201		Tapped @ 8Ω
L5	Line Choke	0Ω		L203		
L6	Input IF	19Ω	19Ω	14977 ■	BC-352	■ Alternate part #1655-16
L7	Output IF	19Ω	19Ω	14977 ■	BC-353	
L8	Hash Choke	0Ω		L202		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AIRCASTLE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115v	V-94 V-83 ①	5301	859	5301	① Alternate Vibrator

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRCASTLE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	15A 32V	A201		311015	155020	AGC-15	HDJ-B

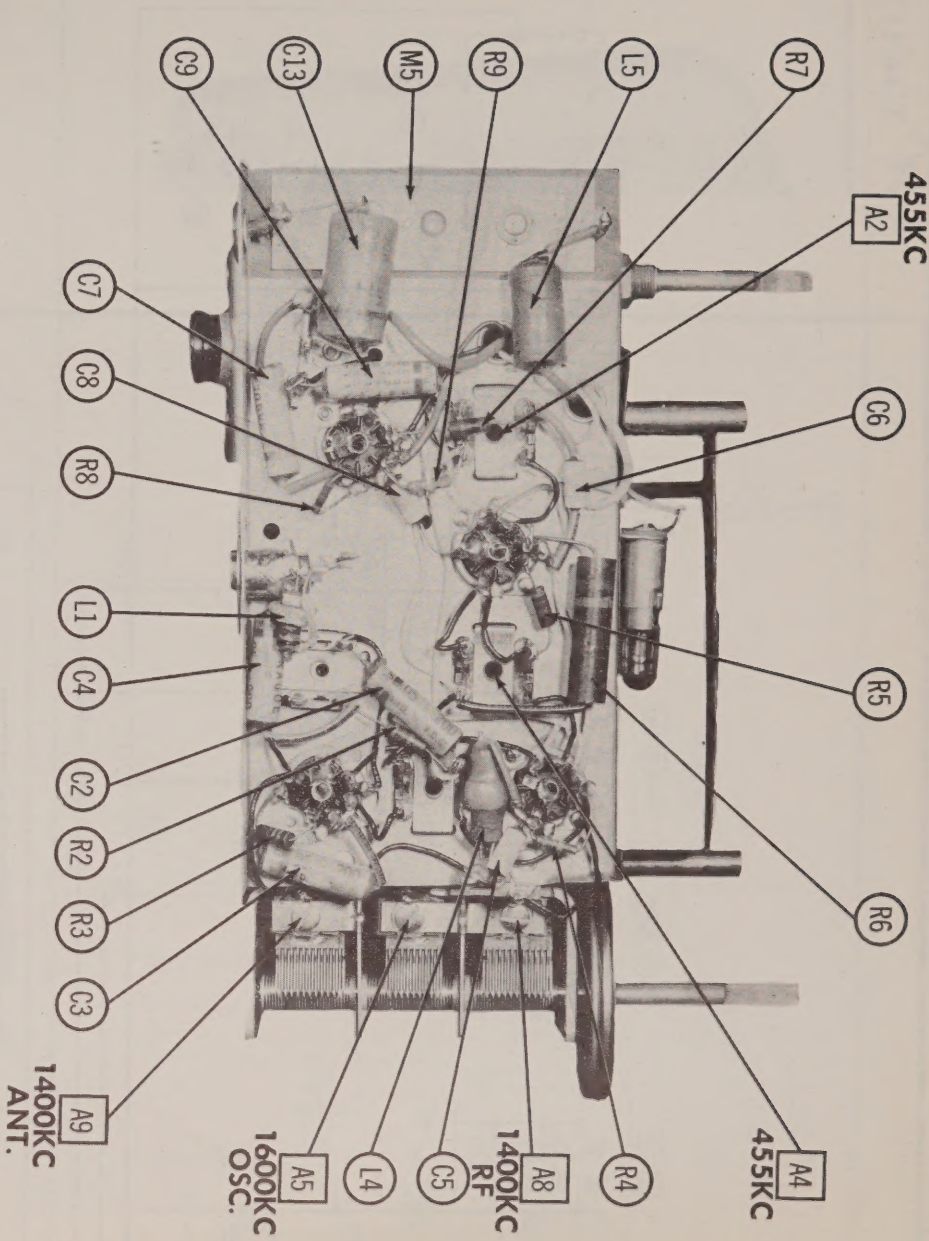
DIAL LIGHTS

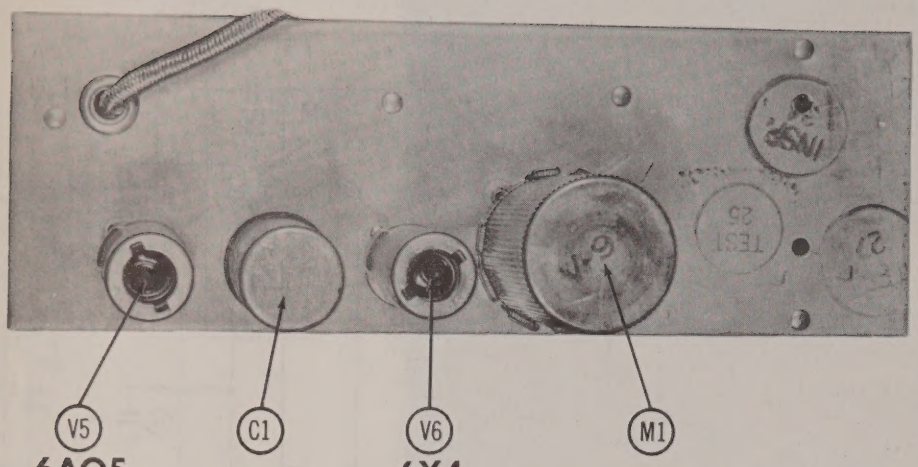
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M3	Bayonet	6-8	.15	Brown	T47		Type #47

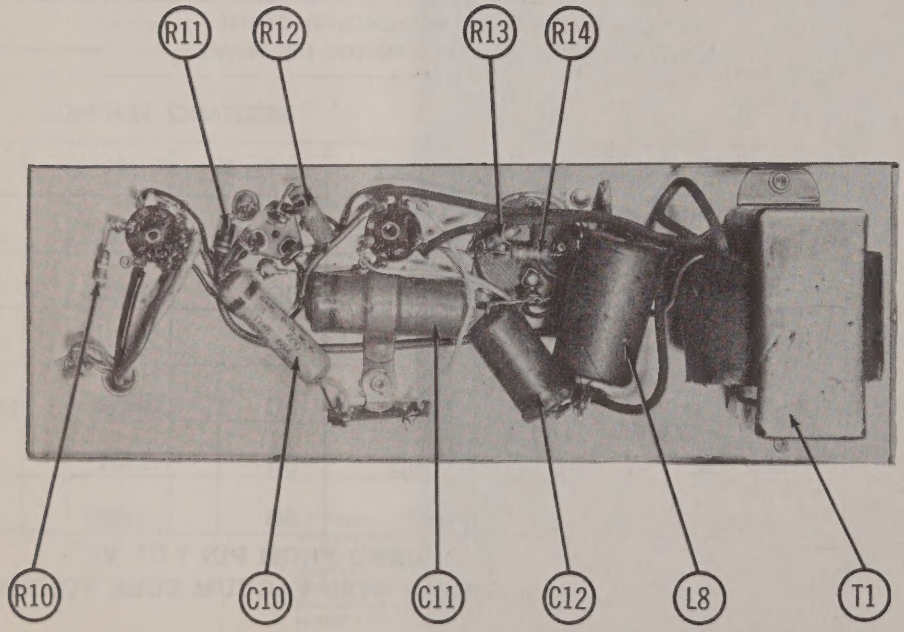
MISCELLANEOUS

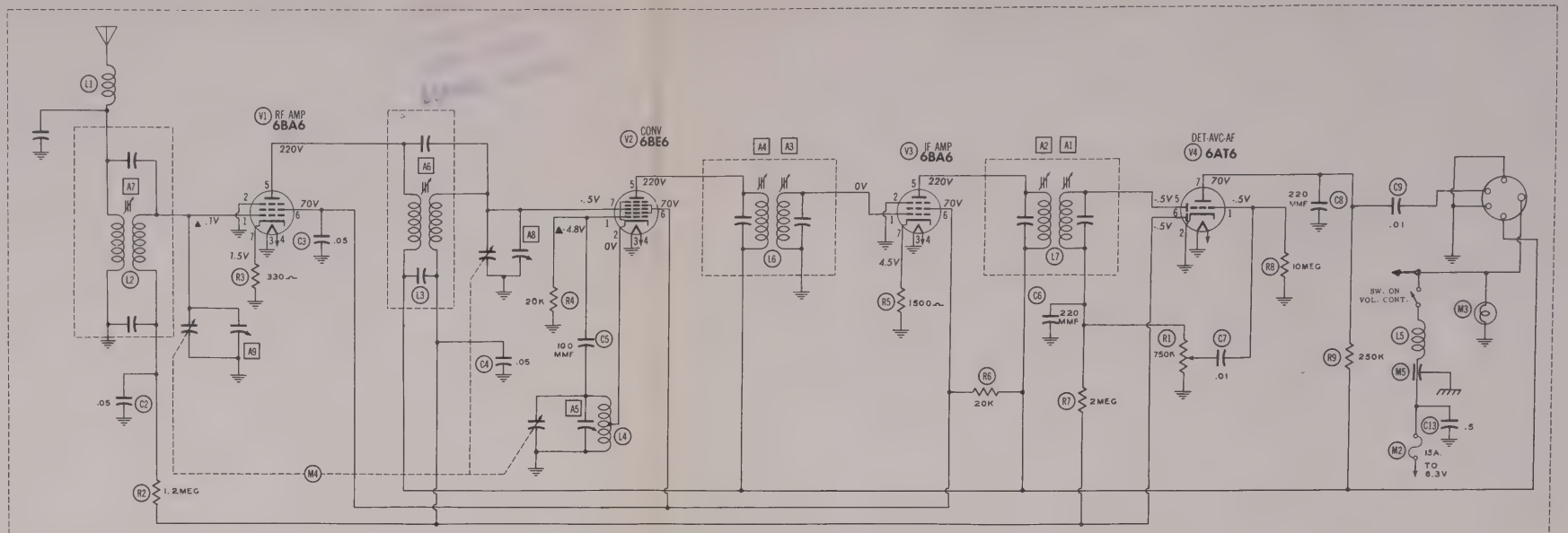
ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M4	3 Gang Var. Cap	CV-400	(25-397MMF, 27-386MMF, 24-201MMF)
M5	Spark Plate		
	Knob	H310	
	Escutcheon	H523	Dial Scale
	Dial Pointer	PS100	

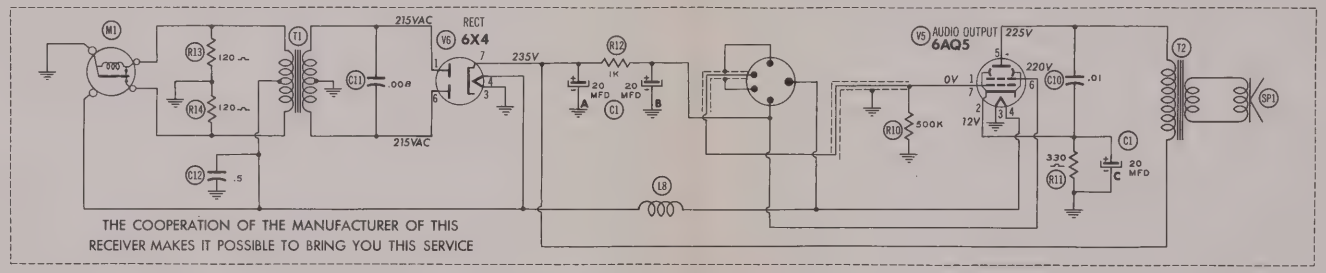
CHASSIS—BOTTOM VIEW




V5
C1
V6
M1
6AQ5
6X4


R11
R12
R13
R14
R10
C10
C11
C12
L8
T1





THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

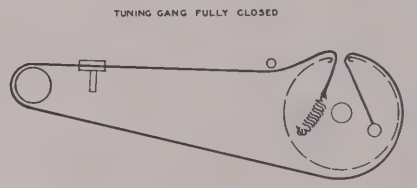
IF=455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	3.9Meg	0Ω	0Ω	.4Ω	†1KΩ	†23KΩ	330Ω
V 2	6BE6	22KΩ	.7Ω	0Ω	.4Ω	†1KΩ	†23KΩ	2.7Meg
V 3	6BA6	19Ω	0Ω	0Ω	.4Ω	†1KΩ	†23KΩ	1.5KΩ
V 4	6AT6	10Meg	0Ω	0Ω	.4Ω	750KΩ	2.7Meg	†270KΩ
V 5	6AQ5	470KΩ	330Ω	0Ω	.4Ω	†260Ω	†1KΩ	470KΩ
V 6	6X4	250Ω	INF	0Ω	.4Ω	INF	260Ω	40KΩ

† MEASURED FROM PIN 7 OF V6

▲ TAKEN WITH VACUUM TUBE VOLTMETER



DIAL CORD DRIVE

1-DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2-Socket connections are shown as bottom views.
3-Measured values are from socket pin to common negative.
4-Battery voltage maintained at 6.3 volts for voltage readings.
5-Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6-Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT STANDARD NOTATION SCHEMATIC

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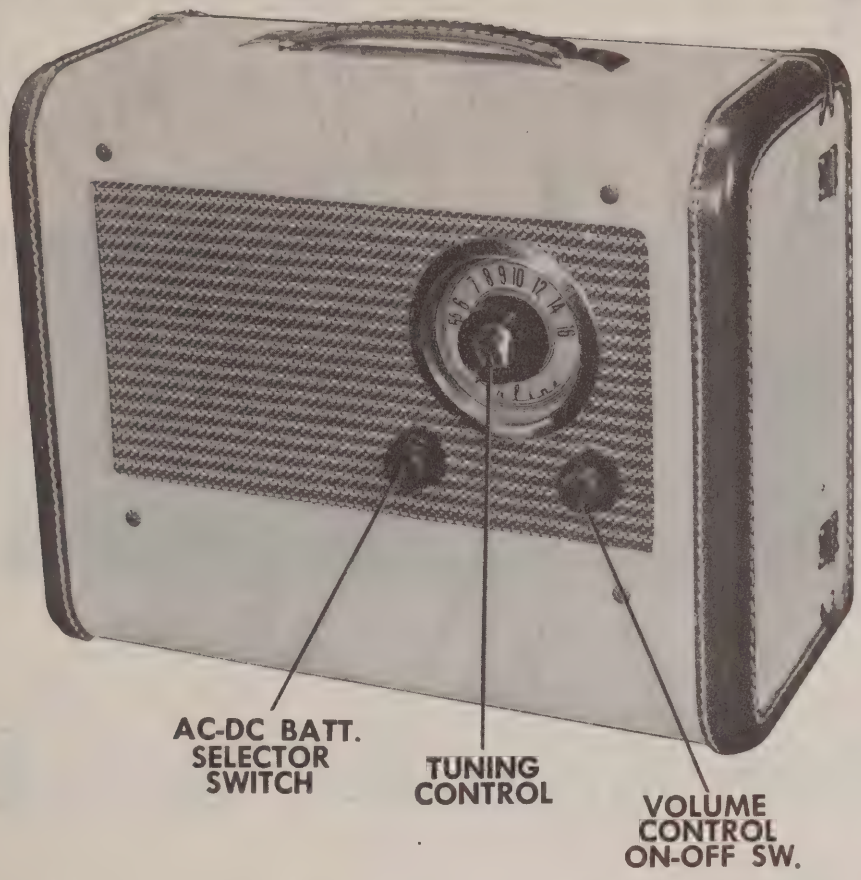
3VA
DENTON, MASS.

AIRLINE
MODEL 15GHM-1070A



AIRLINE
MODEL 15GHM-1070A

TRADE NAME	Airline Model 15GHM-1070A
MANUFACTURER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1L4 or 1T4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 or 3Q5 Audio Output
POWER SUPPLY	110-120 Volts AC/DC or 7.5 Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	.60 Amp. @ 117 Volts AC or 50 MA @ 7.5 Volts DC & 16MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1640 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455 KC (400∿ Mod.)	Tuning gang fully closed	Across voice coil	A1, A2 A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	540 KC	"	"	A5	"
3.	"	"	1640 KC	Tuning gang fully open	"	A6	"
4.		Loop	1400 KC	Tune to 1400 KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

AIRLINE
MODEL 159HM-1070A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2A	IF Amplifier	1L4	1L4	6AR	
B	IF Amplifier	1T4	1T4	6AR	
V3	Det-AVC AF Amp.	1U5	1U5	6BW	
V4A	Audio Output	3V4	3V4	6BX	
B	Audio Output	3Q5	3Q5	7AP	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	AC4			EDL5315X-20		3N529 TC45	TVL-2435 TVA-1208	
B	50	150								
C	200	25								
C2	100	50	AC11	PRS50/100		BRH501		TC3501	TVA-1301	
C3	.1	200	AC2	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C4	.05	200	AC1	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	.1	400	AC3	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C6	51		AC5		TCN-50		N750K-500			
C7	.05	200	AC1	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C8	.05	200	AC1	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C9	100		AC6	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C10	100		AC6	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C11	.005	150	AC7	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C12	.01	600	AC8	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C13	.05	200	AC1	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C14	.01	600	AC8	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C15	.01	600	AC8	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C16	.1	400	AC3	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C17	.1	400	AC3	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C18	100		AC6	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	

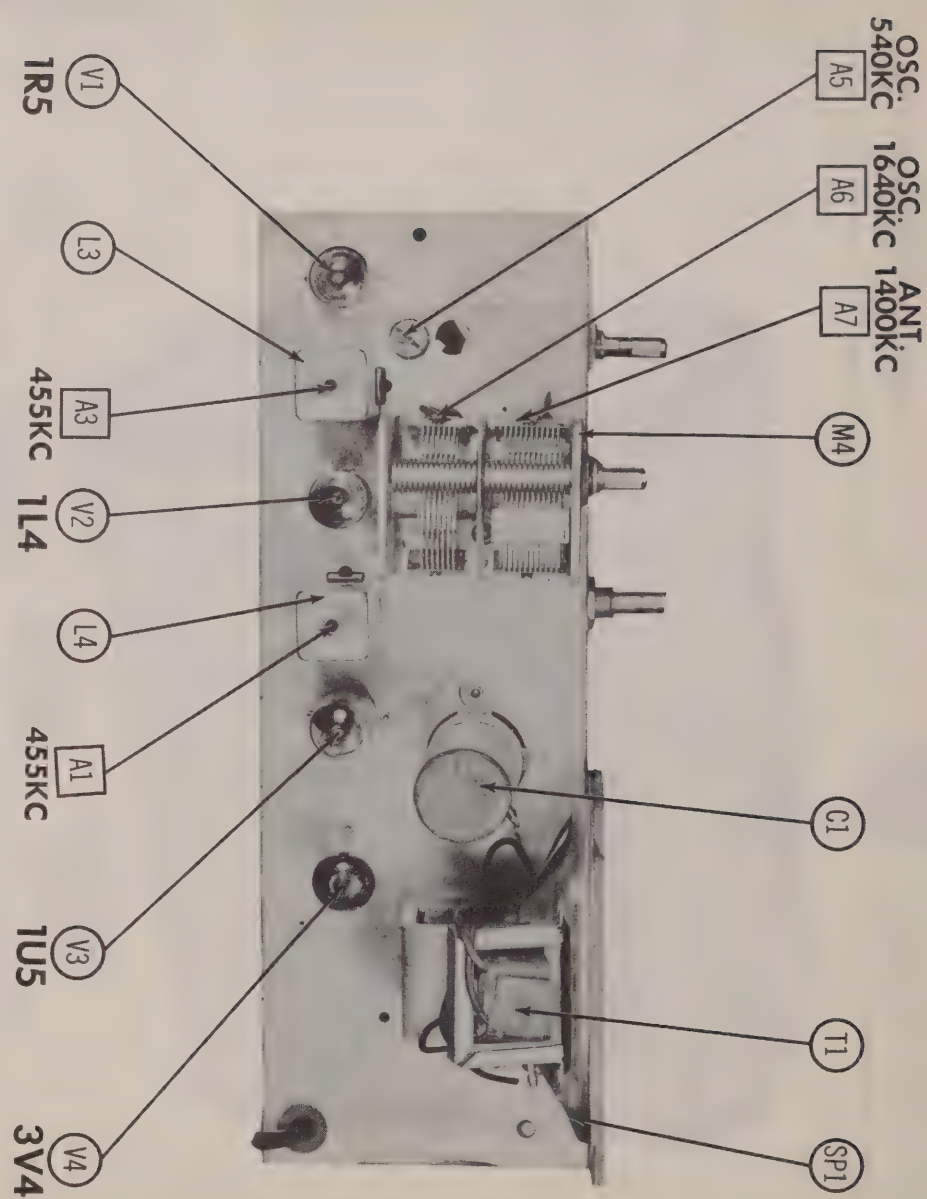
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	CM8406	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	500Ω	½			
R3	400Ω	½			
R4	100KΩ	½	AR3	BTS-100K	
R5	2 Meg	½			
R6	2 Meg	½			
R7	47KΩ	½	AR4	BTS-47K	
R8	430KΩ	½			
R9	10KΩ	½		BTS-10K	
R10	7.5Meg	½			
R11	2 Meg	½			
R12	500KΩ	½			
R13	1 Meg	½	AR12	BTS-1 Meg	
R14	400Ω	½			
R15	500Ω	½			
R16	2000Ω	½			
R17	2500Ω	10	AR16	1 3/4A-2500	
R18	3000Ω	1	AR14		
R19	17Ω	1			
R20	500KΩ	½			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	82KΩ	3.1Ω	475Ω	.4Ω	P-457	A-3823 ①	A-2927 ①	RO-301 ①	S-8X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.1Ω		St. 113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AIRLINE PART No.	MERIT PART No.	
L1	Loop Ant.			AM12		
L2	Osc. Coil	2.1Ω	6Ω	AM6		
L3	Input IF	17Ω	17Ω	AM4	BC-352	
L4	Output IF	17Ω	17Ω	AM4	BC-353	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	AIRLINE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.070A	AM3	NC5	5M1	1101A	6S100	

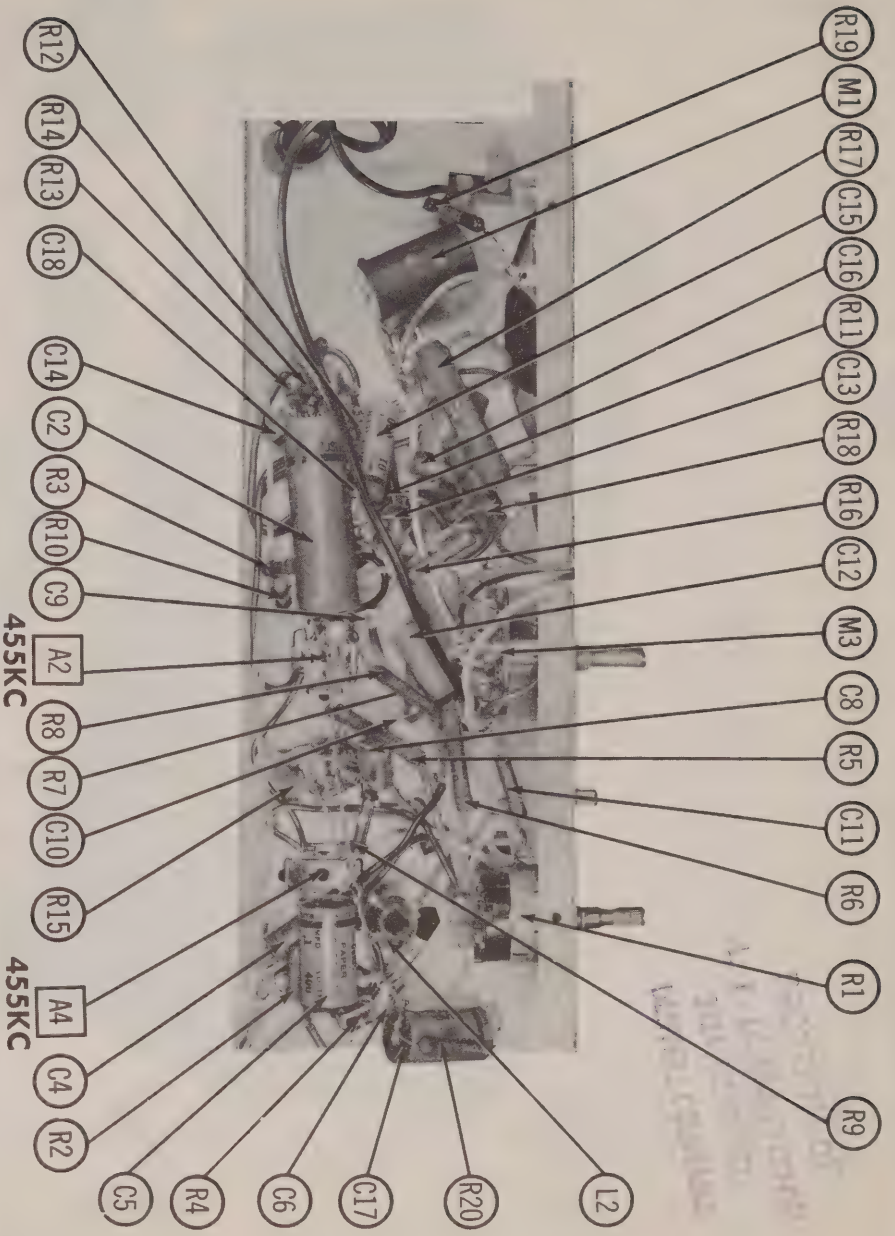
BATTERIES

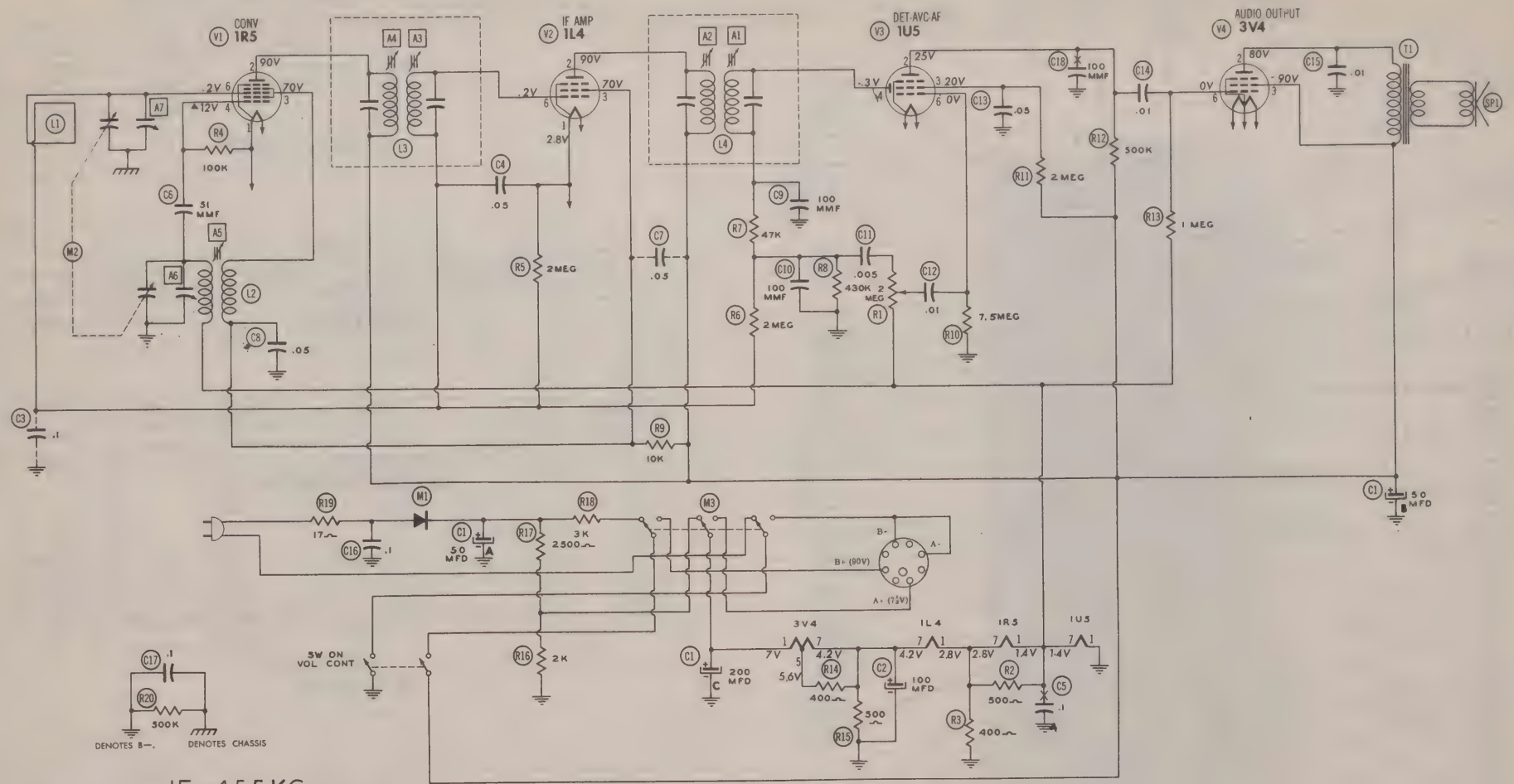
ITEM No.	VOLTAGE	AIRLINE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5V 90V				756			T6Z60	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Switch	AM7	Power Change-Over
M4	2 Gang Var. Cap	AM1	(24-418MMF, 19-178MMF)
	Cabinet	AM14	
	Dial	AM10	Tuning
	Knob	AM11	Volume, Power Selector

CHASSIS—BOTTOM VIEW





IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	•	†3KΩ	†13KΩ	100KΩ	•	1.1Meg	•
V 2	1L4	•	†3KΩ	†13KΩ	INF	•	1.1Meg	•
V 3	1U5	•	†500KΩ	†2 Meg	477KΩ	INF	7.5Meg	•
V 4	3V4	•	†3.5KΩ	†3KΩ	INF	•	1 Meg	•

ALL MEASUREMENTS TAKEN WITH POWER CHANGEOVER SWITCH IN AC (LINE) POSITION
† MEASURED FROM OUTPUT OF M1
▲ TAKEN WITH VACUUM TUBE VOLTMETER
• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

BROOK
MODELS 3B (Issue 2), 3C

BROOK
MODELS 3B (Issue 2), 3C

TRADE NAME	Brook Models 3B (Issue 2), 3C
MANUFACTURER	Brook Electronics, Inc., 34 DeHart Place, Elizabeth, New Jersey
TYPE SET	Three Channel (Model 3C) or Five Channel (Model 3B) Pre-amplifier
TUBES (Four)	Types 6SJ7 Audio Amplifiers

MODEL 3B (ISSUE 2) IS DESIGNED TO OPERATE WITH BROOK POWER AMPLIFIER MODEL 10C COVERED IN PHOTOFACT SET 41 FOLDER 4. THE TWO UNITS COMBINED FORM MODEL 10C3.
MODEL 3C IS DESIGNED TO OPERATE WITH BROOK POWER AMPLIFIER MODEL 12A COVERED IN PHOTOFACT SET 89 FOLDER 3. THE TWO UNITS COMBINED FORM MODELS 12A2 & 12A3.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: BROOK PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	AF Amplifier	6SJ7	6SJ7	8N	
V2	AF Amplifier	6SJ7	6SJ7	8N	
V3	AF Amplifier	6SJ7	6SJ7	8N	
V4	AF Amplifier	6SJ7	6SJ7	8N	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BROOK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■20	475		AFH4-80		UP8D1127				
B	▲20	475								
C	▬20	475								
D	40	50								
C2	50	50		PRS50/50		BR505		TC39	TVA-1308	Note 2
C3	200	500		1468-0002	D6-201	5W5T2	GP2K-201	MC237	1FM-32	Note 1
C4	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C5	.03	600		P688-03		PTE6S3		PT613	6TM-S3	
C6	.03	600		P688-03		PTE6S3		PT613	6TM-S3	
C7	.02	400		P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C8	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C9	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C10	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C11	.022	400		P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C12	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C13	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C14	.5	400		484-5		PJ4P5		PT405	4TM-P1	
C15	.2	200		484-2		PTE4P22			2TM-P22	
C16	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C17	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C18	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C19	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C20	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C21	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C22	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C23	.02	400		P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C24	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C25	.015	200		P288-015		PTE6S15			6TM-S15	
C26	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C27	.0015	200		P688-0015	D6-152	PTE6D15	GP2L-152	UC-5215	6TM-D15	

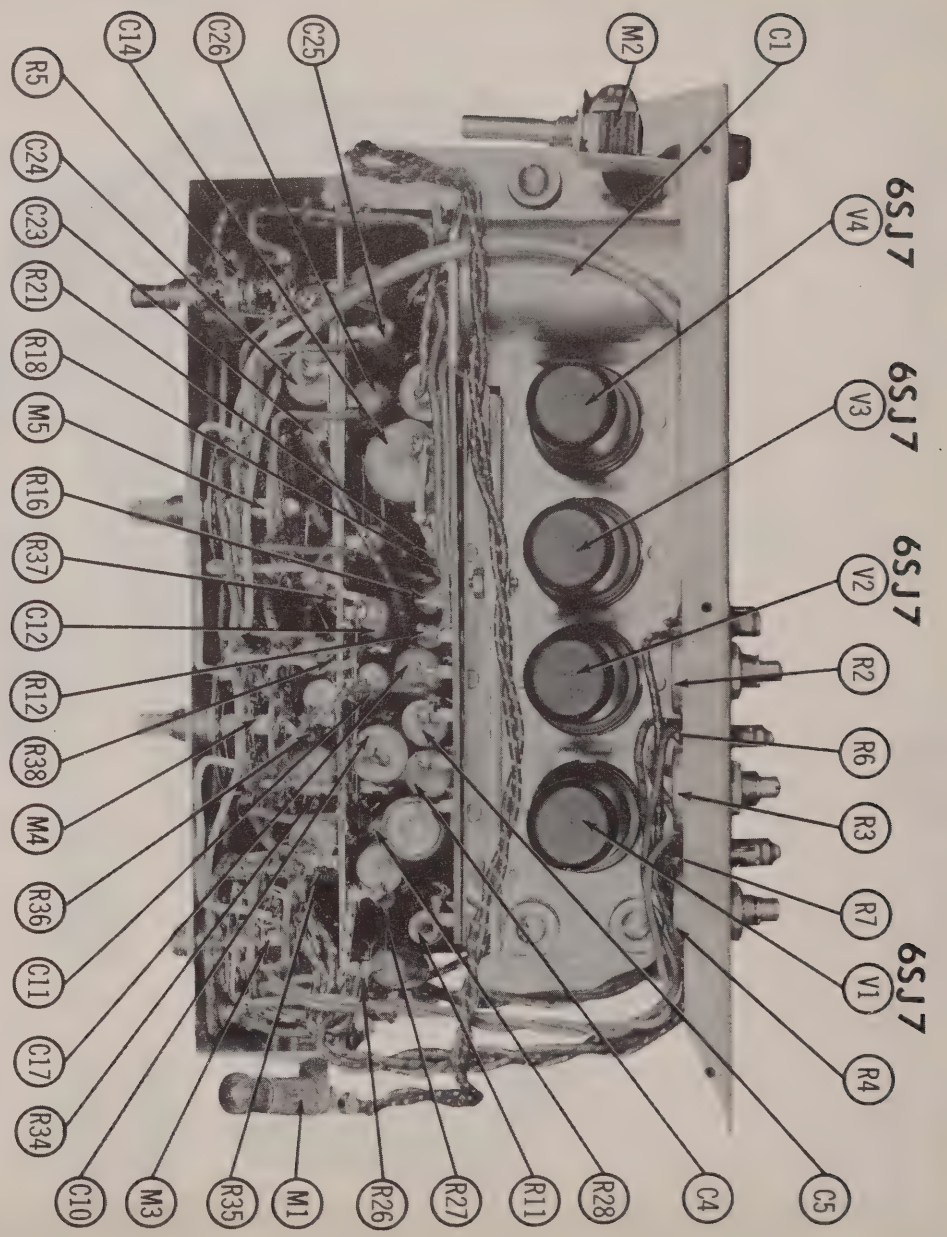
Note 1. Used in Model 3B only.
Note 2. Some Models use 40MFD in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250KΩ	½		Q13-130	AG-64-Z	AB-51	U-44	Gain-Note
B	Shaft			Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R1A
R2A	250KΩ	½		Q13-130	AG-64-Z	AB-51	U-44	Gain
B	Shaft			Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	250KΩ	½		Q13-130	AG-64-Z	AB-51	U-44	Gain
B	Shaft			NotReq.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	250KΩ	½		Q13-130	AG-64-Z	AB-51	U-44	Gain
B	Shaft			Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	500KΩ	½						Volume-Tap ⓐ 100KΩ & 200KΩ-Panel
B	10KΩ	½						Volume-Rear

Note. Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BROOK PART No.	IRC PART No.	
R6	47KΩ	½		BTS-47K	
R7	47KΩ	½		BTS-47K	
R8	470KΩ	½		BTS-470K	Note 1
R9	470KΩ	½		BTS-470K	
R10	1500Ω	2		BTB-1500	
R11	50KΩ	10			
R12	10KΩ	1		BTA-10K	
R13	470KΩ	½		BTS-470K	
R14	1500Ω	2		BTB-1500	
R15	47KΩ	1		BTA-47K	
R16	10KΩ	1		BTA-10K	
R17	1500Ω	2		BTB-1500	
R18	100KΩ	1		BTA-100K	
R19	470KΩ	½		BTS-470K	
R20	1500Ω	2		BTB-1500	
R21	47KΩ	1		BTA-47K	
R22	10KΩ	1		BTA-10K	
R23	220KΩ	½		BTS-220K	
R24	2.2Meg	½		BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BROOK PART No.	IRC PART No.	
R25	33KΩ	1		BTA-33K	
R26	2.2Meg	½		BTS-2.2Meg	
R27	68KΩ	1		BTA-68K	
R28	33KΩ	1		BTA-33K	
R29	22KΩ	½		BTS-22K	
R30	15KΩ	½		BTS-15K	
R31	2.2Meg	½		BTS-2.2Meg	
R32	2.2Meg	½		BTS-2.2Meg	
R33	2.2Meg	½		BTS-2.2Meg	
R34	2.2Meg	½		BTS-2.2Meg	
R35	2.2Meg	½		BTS-2.2Meg	
R36	2.2Meg	½		BTS-2.2Meg	
R37	2.2Meg	½		BTS-2.2Meg	Note 1
R38	2.2MEg	½		BTS-2.2Meg	Note 1
R39	220Ω	½		BTS-220	
R40	220Ω	½		BTS-220	
R41	470KΩ	½		BTS-470K	
R42	470KΩ	½		BTS-470K	
R43	4700Ω	½		BTS-4700	
R44	4700Ω	½		BTS-4700	

Note Not used in all models.

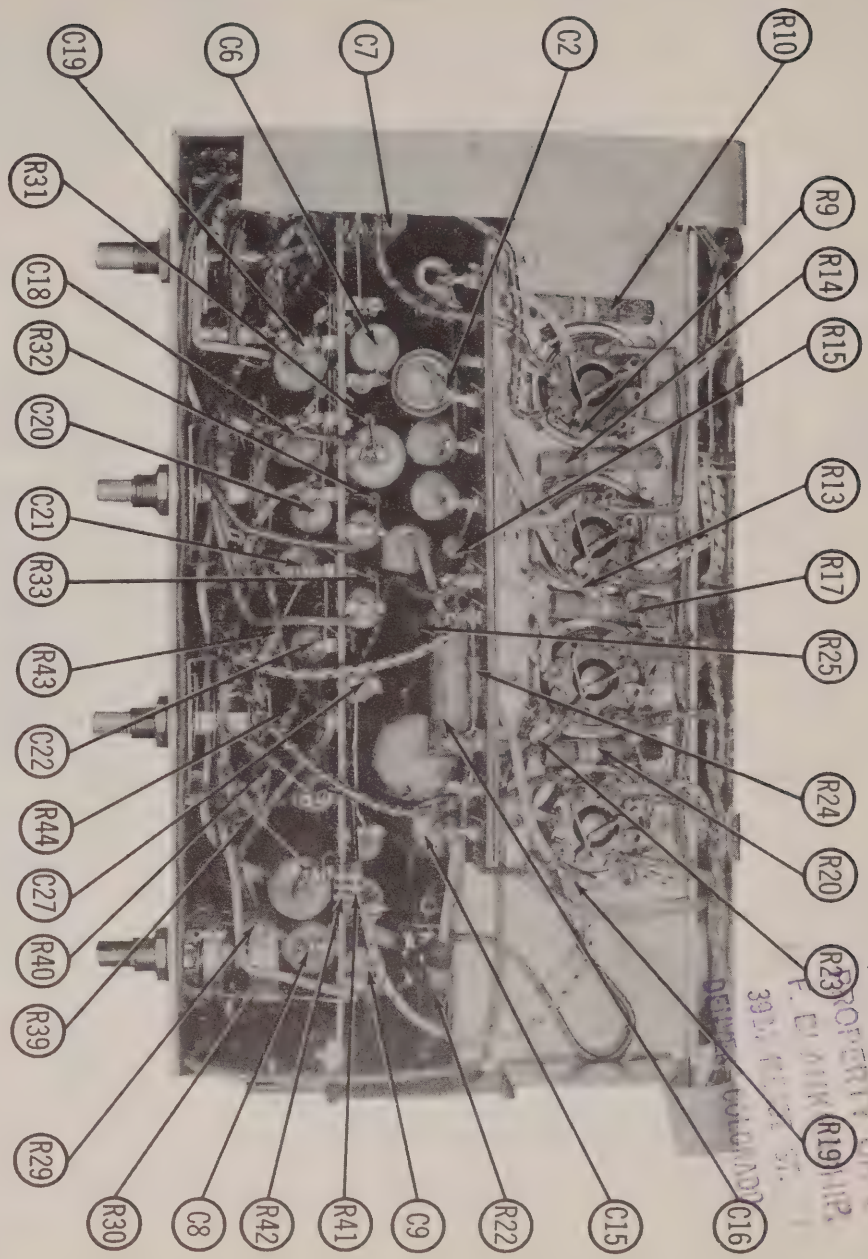
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					BROOK PART No.		
M1	Bayonet	7.5	2	White			Type #51

MISCELLANEOUS

ITEM No.	PART NAME	BROOK PART No.	NOTES
M2	Switch		Power On/Off
M3	Switch		Channel Selector
M4	Switch		Bass Control
M5	Switch		Treble Control

CHASSIS—BOTTOM VIEW



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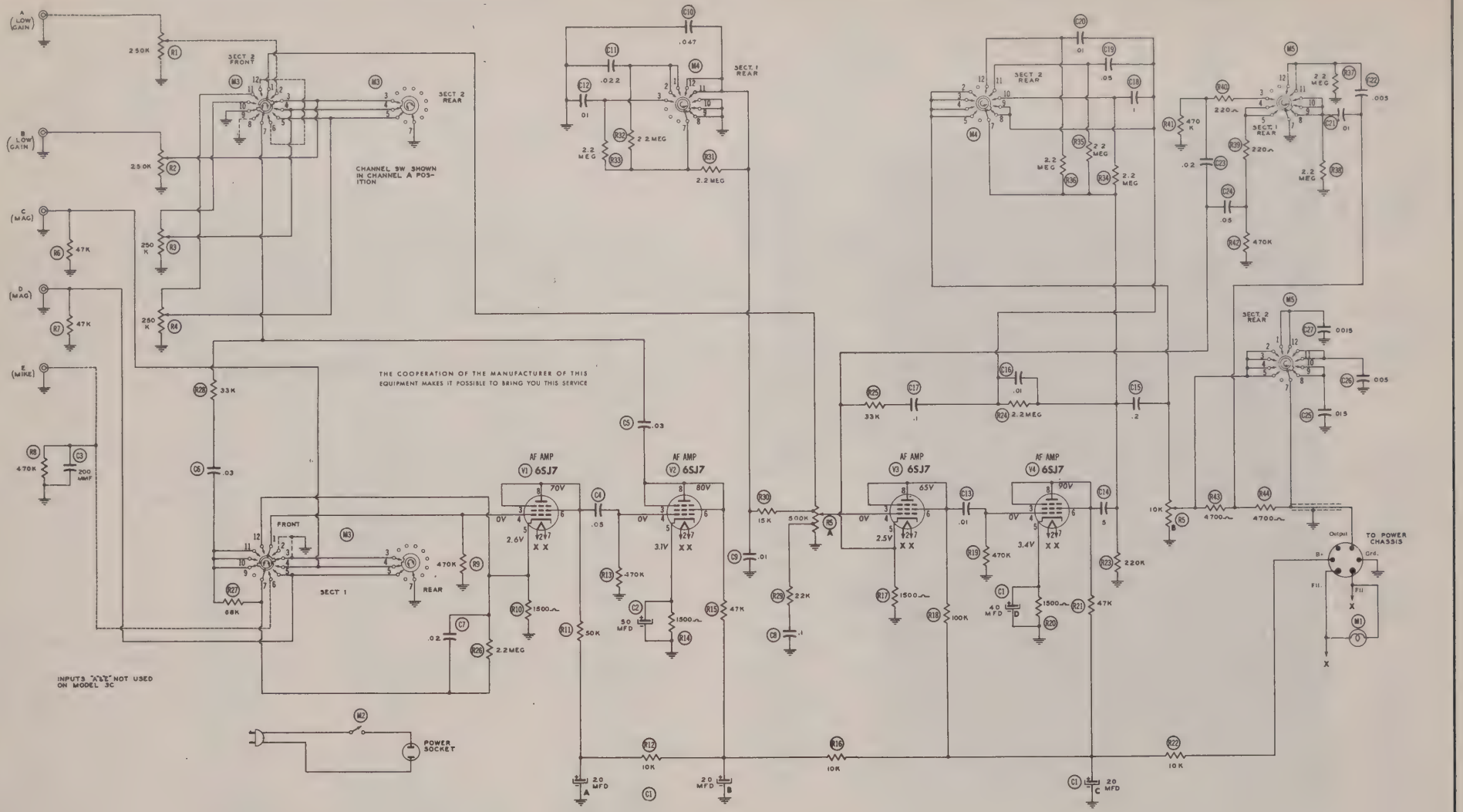
3924
DEERE & COMPANY



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SJ7	0Ω	33KΩ	†82KΩ	0Ω	1.5KΩ	†82KΩ	33KΩ	†82KΩ
V 2	6SJ7	0Ω	33KΩ	†72KΩ	470KΩ	1.5KΩ	†72KΩ	33KΩ	†72KΩ
V 3	6SJ7	0Ω	33KΩ	†110KΩ	30Ω	1.5KΩ	†110KΩ	33KΩ	†110KΩ
V 4	6SJ7	0Ω	33KΩ	†57KΩ	470KΩ	1.5KΩ	†57KΩ	33KΩ	†57KΩ

ALL MEASUREMENTS TAKEN IN "A" CHANNEL POSITION
BASS & TREBLE SWITCHES IN #1 POSITION (FULLY COUNTERCLOCKWISE)
† MEASURED FROM FILAMENT OF POWER SUPPLY RECTIFIER TUBE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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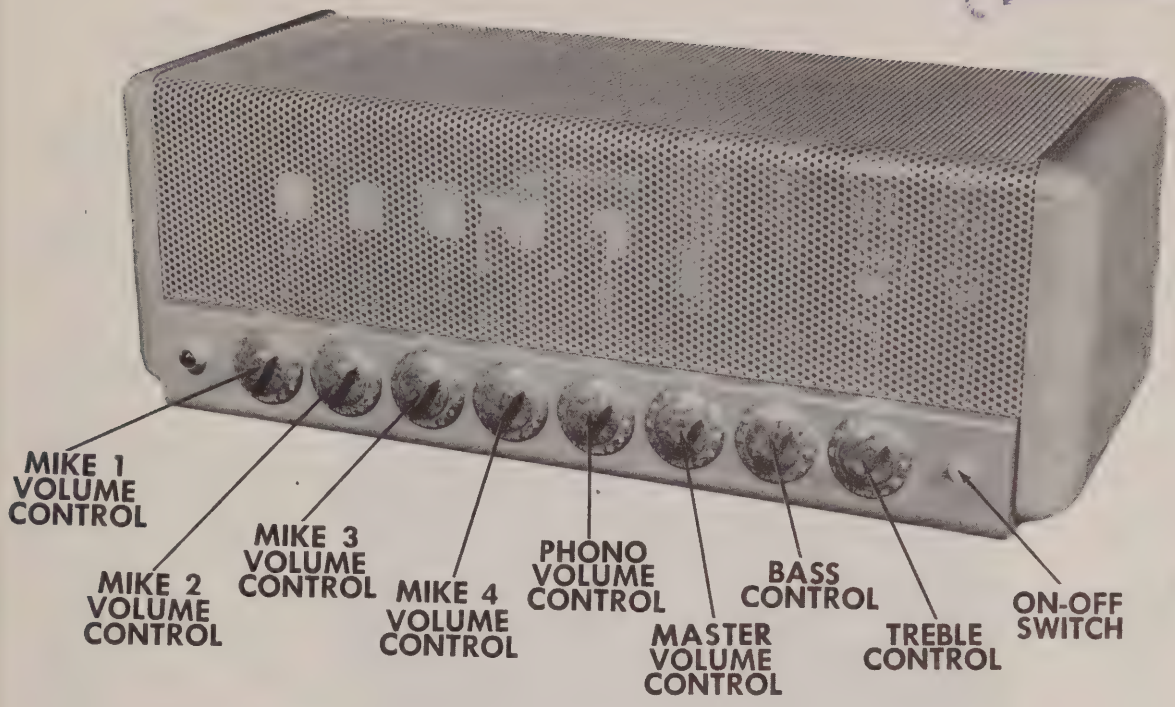
1-DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2-Socket connections are shown as bottom views.
3-Measured values are from socket pin to common negative.
4-Line voltage maintained at 117 volts for voltage readings.
5-Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6-All controls at minimum proper output load connected.

F. B...
3924 ...
DENVER, CO...



DUKANE
MODEL 1A45-A

TRADE NAME	DuKane Model 1A45-A
MANUFACTURER	DuKane Corp., St. Charles, Ill.
TYPE SET	AC Operated Five Channel 50 Watt Audio Amplifier
TUBES (Twelve)	Types (4) 6J7 Mic. Pre-Amp., 6J7 Mixer, 6SN7GT AF Amp.-Phase Inv., (4) 6L6G Audio Output, (2) 5U4G Rectifier
POWER SUPPLY	110-120 Volts AC-50/60 Cycles RATING 2.4 Amp. @ 117 volts AC

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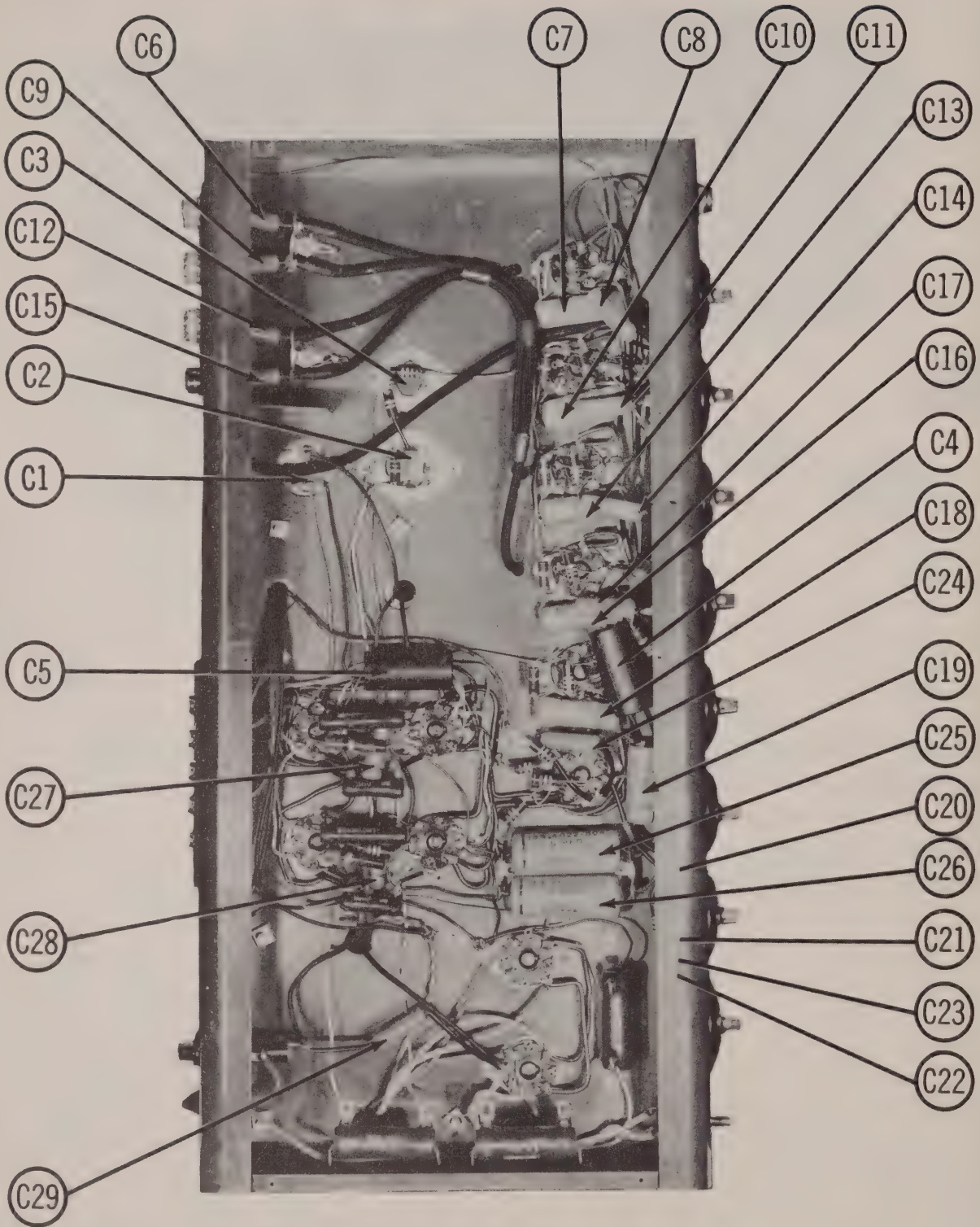
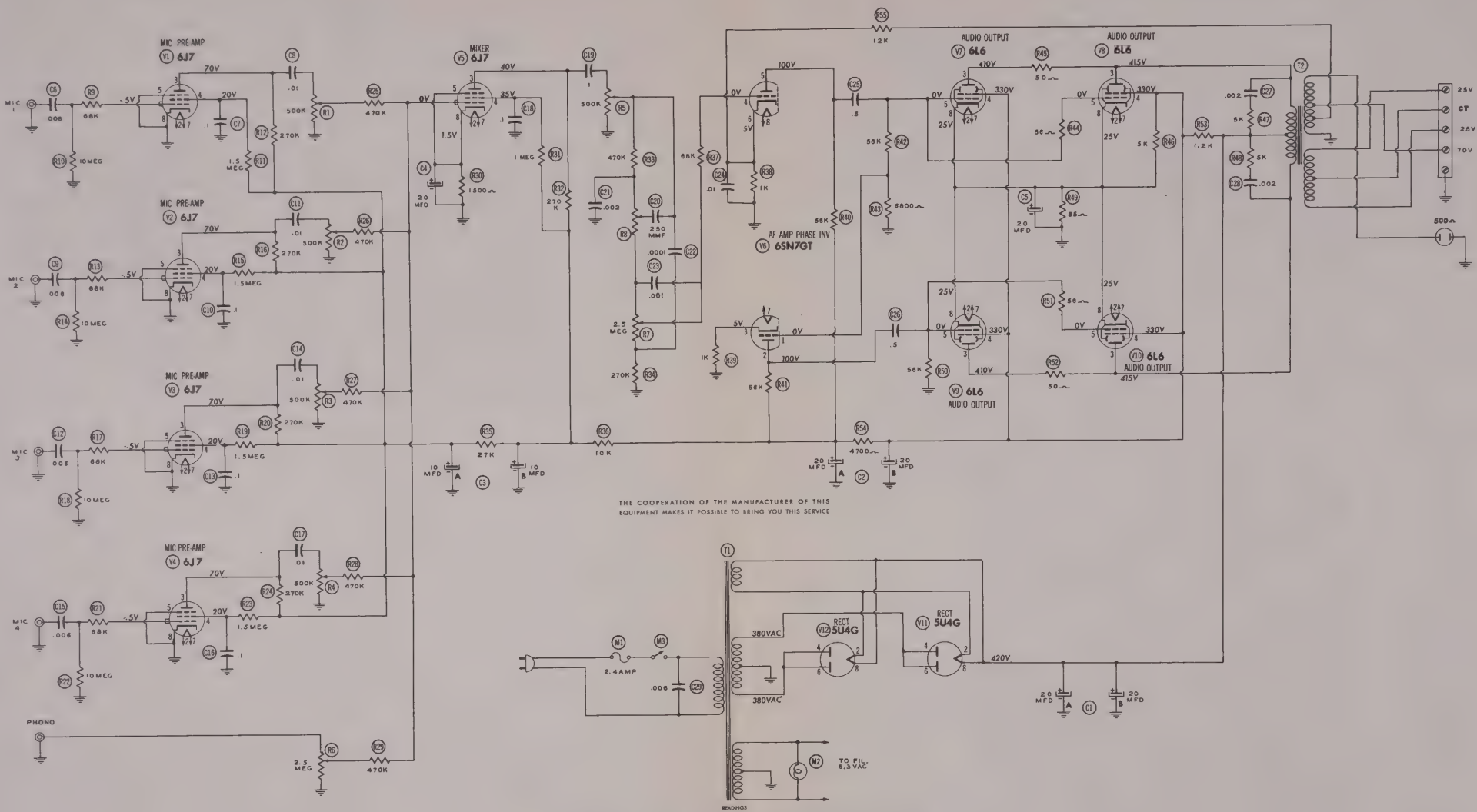


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J7	0Ω	.1Ω	†310KΩ	†1.5Meg	0Ω	†43KΩ	.1Ω	0Ω	10Meg
V 2	6J7	0Ω	.1Ω	†310KΩ	†1.5Meg	0Ω	†43KΩ	.1Ω	0Ω	10Meg
V 3	6J7	0Ω	.1Ω	†310KΩ	†1.5Meg	0Ω	†43KΩ	.1Ω	0Ω	10Meg
V 4	6J7	0Ω	.1Ω	310KΩ	†1.5Meg	0Ω	†43KΩ	.1Ω	0Ω	10Meg
V 5	6J7	0Ω	.1Ω	†285KΩ	†1 Meg	1.5KΩ	†18KΩ	.1Ω	1.5KΩ	2 Meg
V 6	6SN7GT	6.8KΩ	†62KΩ	1KΩ	820KΩ	†62KΩ	1KΩ	.1Ω	.1Ω	
V 7	6L6G	0Ω	.1Ω	†124Ω	†1.2KΩ	63KΩ	†5KΩ	.1Ω	85Ω	
V 8	6L6G	0Ω	.1Ω	†84Ω*	†1.2KΩ	63KΩ	†0Ω	.1Ω	85Ω	
V 9	6L6G	0Ω	.1Ω	†144Ω	†1.2KΩ	56KΩ	†5KΩ	.1Ω	85Ω	
V 10	6L6G	0Ω	.1Ω	†94Ω	†1.2KΩ	56KΩ	†0Ω	.1Ω	85Ω	
V 11	5U4G	INF.	6.2KΩ	INF.	21Ω	INF.	21Ω	INF.	6.2KΩ	
V 12	5U4G	INF.	6.2KΩ	INF.	23Ω	INF.	23Ω	INF.	6.2KΩ	

† MEASURED FROM PINS 8 OF V11 & V12

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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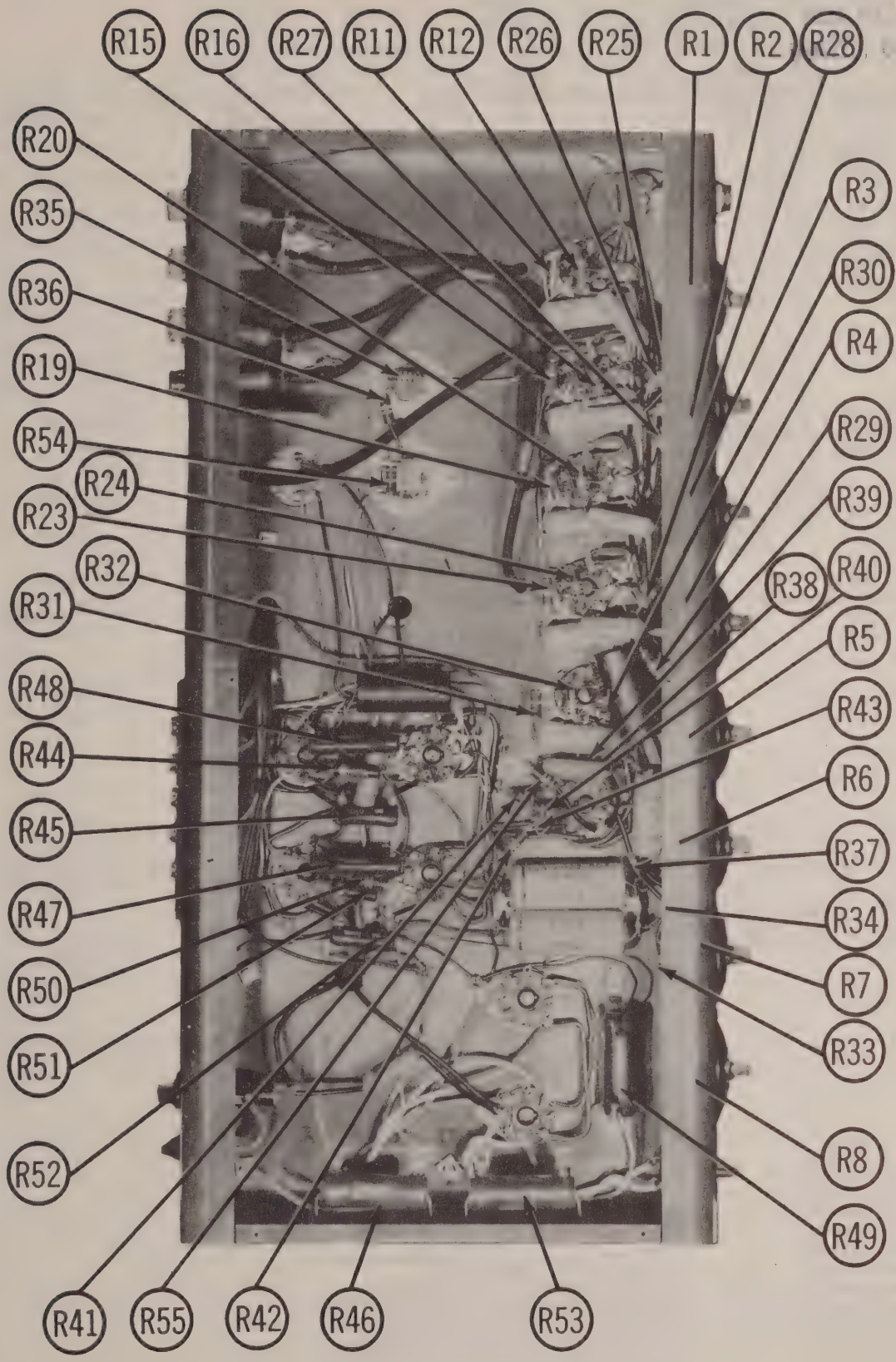


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DUKANE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Mic Pre-Amp.	262-6J7	6J7	7R	
V2	Mic Pre-Amp.	262-6J7	6J7	7R	
V3	Mic Pre-Amp.	262-6J7	6J7	7R	
V4	Mic Pre-Amp.	262-6J7	6J7	7R	
V5	Mixer	262-6J7	6J7	7R	
V6	AF Amplifier – Phase Inverter	262-6SN7GT	6SN7GT	8BD	
V7	Audio Output	262-6L6G	6L6G	7AC	
V8	Audio Output	262-6L6G	6L6G	7AC	
V9	Audio Output	262-6L6G	6L6G	7AC	
V10	Audio Output	262-6L6G	6L6G	7AC	
V11	Rectifier	262-5U4G	5U4G	5T	
V12	Rectifier	262-5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

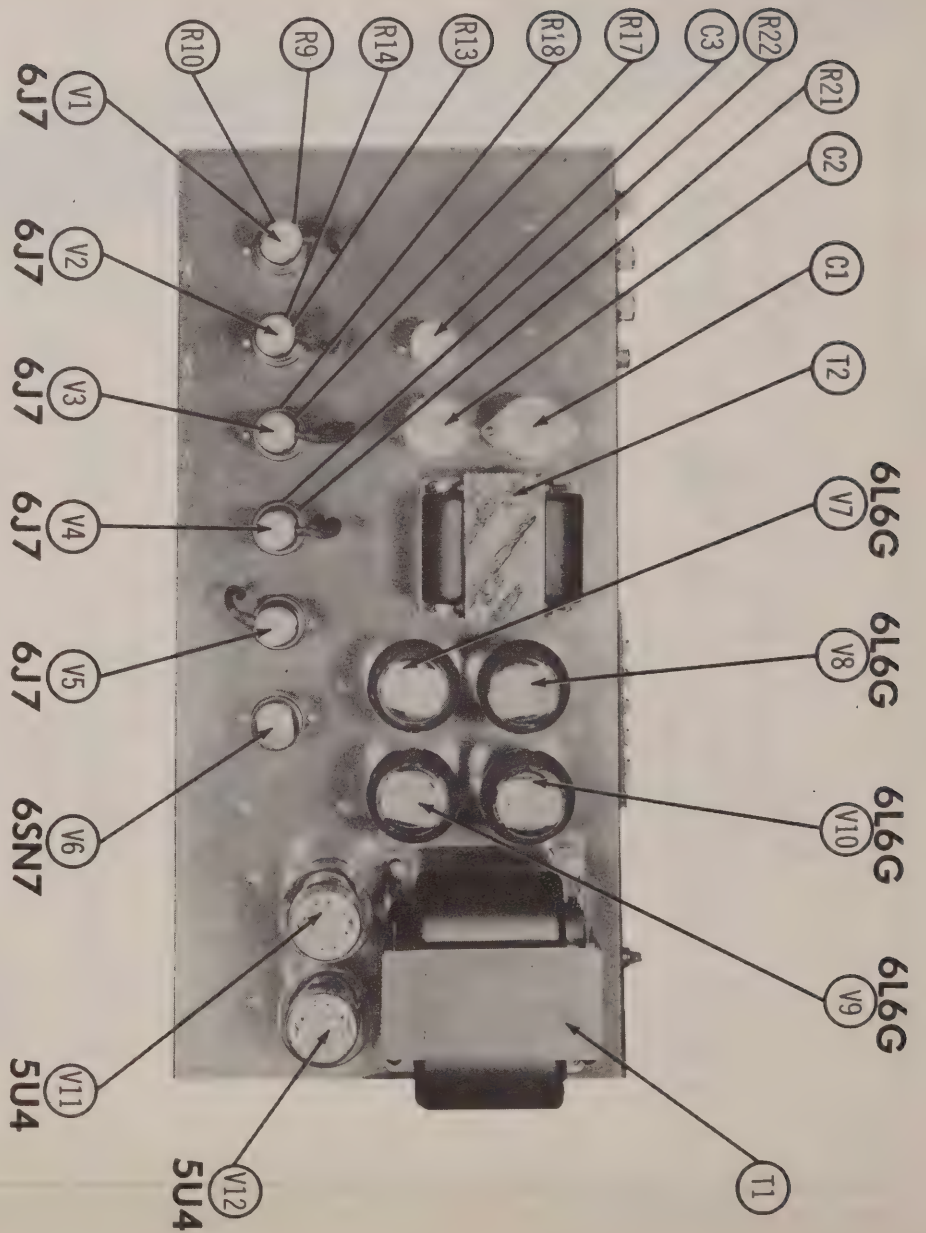
ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DUKANE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	500	199-2914	AFH4-20		UP2250		FP288	TVL-1820	
B	▲20	500								
C2A	▲20	500	199-2914	AFH4-20		UP2250		FP288		
B	▲ 20	500								
C3A	▲10	450	199-2902	AFH2-47		UPT1145		FP231	TVL-2750	
B	■10	450								
C4	20	150	199-2016-206	PRS150/20		BR2015A		TC45	TVA-1410	Note 1
C5	20	150	199-2016-206	PRS150/20		BR2015A		TC45	TVA-1410	
C6	.006	600	199-4030-602	P688-006	D6-602	PTE6D6	GP2-333-602	PT626	6TM-D6	
C7	.1	400	199-4021-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C8	.01	400	199-4020-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C9	.006	600	199-4030-602	P688-006	D6-602	PTE6D6	GP2-333-602	PT626	6TM-D6	
C10	.1	400	199-4021-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C11	.01	400	199-4020-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C12	.006	600	199-4030-602	P688-006	D6-602	PTE6D6	GP2-333-602	PT626	6TM-D6	
C13	.1	400	199-4021-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C14	.01	400	199-4020-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C15	.006	600	199-4030-602	P688-006	D6-602	PTE6D6	GP2-333-602	PT626	6TM-D6	
C16	.1	400	199-4021-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C17	.01	400	199-4020-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C18	.1	400	199-4021-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C19	.1	400	199-4021-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C20	250	500	199-3001-251	1468-00025	D6-251	5W5T25	GP2K-251	MC240	1FM-325	
C21	.002	600	199-4020-202	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C22	.0001	600	199-4030-101	S1100	D6-101	TM5T1	GP1K-101	UC-531	6TM-T1	
C23	.001	600	199-4020-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C24	.01	400	199-4020-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C25	.5	400	199-4022-504	484-5		PJ4P5		PT405	4TM-P5	
C26	.5	400	199-4022-504	484-5		PJ4P5		PT405	4TM-P5	
C27	.002	1200	199-5041-202	P1688-002		PTE16D2		PT1622	MB-D2	
C28	.002	1200	199-5041-202	P1688-002		PTE16D2		PT1622	MB-D2	
C29	.006	600	199-4030-602	P688-006		PTE6D6		PT626	6TM-D6	

Note 1. Some Models use 25V unit (Part #199-2001-206)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DUKANE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	601-3289	Q13-133	AM-60-Z	B-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	601-3289	Q13-133	AM-60-Z	B-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	601-3289	Q13-133	AM-60-Z	B-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R3A
R4A	500KΩ	½	601-3289	Q13-133	AM-60-Z	B-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R4A
R5A	500KΩ	½	601-3289	Q13-133	AM-60-Z	B-60	U-48	Volume-Master
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R5A
R6A	2.5Meg	½	601-3589	Q13-140	AM-66-Z	B-85	U-57	Phono Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R6A
R7	2.5Meg	½	601-10					Bass
R8	300KΩ	½	601-11					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DUKANE PART No.	IRC PART No.	
R9	68KΩ	½		BTS-68K	
R10	10Meg	½		BTS-10Meg	
R11	1.5Meg	1	600-0116-155	BTA-1.5Meg	
R12	270KΩ	1	600-0116-247	BTA-270K	
R13	68KΩ	½		BTS-68K	
R14	10Meg	½		BTS-10Meg	
R15	1.5Meg	1	600-0116-155	BTA-1.5Meg	
R16	270KΩ	1	600-0116-274	BTA-270K	
R17	68KΩ	½		BTS-68K	
R18	10Meg	½		BTS-10Meg	
R19	1.5Meg	1	600-0116-155	BTA-1.5Meg	
R20	270KΩ	1	600-0116-274	BTA-270K	
R21	68KΩ	½		BTS-68K	
R22	10Meg	½		BTS-10Meg	
R23	1.5Meg	1	600-0116-155	BTA-1.5Meg	
R24	270KΩ	1	600-0116-274	BTA-270K	
R25	470KΩ	1	600-0116-474	BTA-470K	
R26	470KΩ	1	600-0116-474	BTA-470K	
R27	470KΩ	1	600-0116-474	BTA-470K	
R28	470KΩ	1	600-0116-474	BTA-470K	
R29	470KΩ	1	600-0116-474	BTA-470K	
R30	1500Ω	1	600-0116-152	BTA-1500	
R31	1 Meg	1	600-0116-105	BTA-1 Meg	
R32	270KΩ	1	600-0116-274	BTA-270K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PART No.	IRC PART No.	
R33	470KΩ	1	600-0116-474	BTA-470K	
R34	270KΩ	1	600-0116-274	BTA-270K	
R35	27KΩ	1	600-0116-273	BTA-27K	
R36	10KΩ	1	600-9116-103	BTA-10K	
R37	68KΩ	½	600-0043-683	BTS-68K	
R38	1000Ω	1	600-0116-102	BTA-1000	
R39	1000Ω	1	600-0116-102	BTA-1000	
R40	56KΩ	1	600-0116-563	BTA-56K	
R41	56KΩ	1	600-0116-563	BTA-56K	
R42	56KΩ	1	600-9116-563	BTA-56K	
R43	6800Ω	1	600-0116-682	BTA-6800	
R44	56Ω	1	600-1004-560		
R45	50Ω	5	600-1008-500	1 3/4A-50	
R46	5000Ω	25	600-1018-502	4½E-50	
R47	5000Ω	10	600-1011-502	1 3/4A-5000	
R48	5000Ω	10	600-1011-502	1 3/4A-5000	
R49	85Ω	25	600-9015		
R50	56KΩ	1	600-0116-563	BTA-56K	
R51	56Ω	1	600-1004-560		
R52	50Ω	5	600-1008-500	1 3/4A-50	
R53	1200Ω	25	600-9008	4½E-1200	
R54	4700Ω	1	600-0116-472	BTA-4700	
R55	12KΩ	1	600-0116-123	BTS-12K	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	DUKANE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @2.4A	760VCT .325ADC	5VAC @ 6A	6.3VAC @ 5.7A	710-4067				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		DUKANE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC#1	PRI.	SEC#1						
T2	3300Ω CT	500Ω Tap @ 100Ω SEC 2 12.5Ω CT	178Ω CT	35.3Ω Tap @ 1.1Ω(†) 27Ω(*) SEC 2 .8Ω CT(§)	710-2020					† Feedback Winding * 70 Volt Line § 25 Volt Line

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DUKANE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	5A 250V.	320-835-0500		312005	342001	MTH-5	HKP

PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					DUKANE PART No.		
M2	Bayonet	6-8	.15	Brown			Type #47 - Some Models may use Type #44

MISCELLANEOUS

ITEM No.	PART NAME	DUKANE PART No.	NOTES
M3	Switch	680-6615	Power On/Off

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

EMERSON
MODEL 704 (Ch. 120154-B)

EMERSON
MODEL 704 (Ch. 120154-B)

TRADE NAME	Emerson Model 704 (Ch. 120154-B)
MANUFACTURER	Emerson Radio & Phono. Corp. 111 Eighth Ave., New York 11, N.Y.
TYPE SET	Battery Operated Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY RATING	1.5 Volts DC "A" Supply & 67.5 Volts DC "B" Supply 250 MA @ 1.5 Volts DC & 8.2MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of singal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator lug of RF section of tuning gang.	455 KC (400~ Mod.	Tuning gang fully open	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.		Loop	535KC	Tuning gang fully closed	"	A5	Fashipn loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1620 KC	Tuning gang fully open	"	A6	"
4.		"	1400 KC	Tune to 1400 KC signal	"	A7	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	10	70	925217	E26E157		BBR-10-90			TVA-1406	
C2	.05	200	920507							
C3	.01	200	920509	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C4	.003	200	920140	SI3000	D6-302	TM5D3	GP2-333-302	UC-523	5GA-D3	
C5	3.3		925032	SI3.3NP0	TCZ-3.3		NP0K- 3R3	ZT-5533	5TCCB-V33	
C6	100		928013	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C7A	200		928034	SI200	D6-201	TM5T2	GP2K-201	UC-532	34C8	
B	.001			BPD-001	DD-102	TM5D1	801-001	DC-521		
C	100			SI100	D6-101	TM5T1	GP1K-101	UC-531		
D	.01			BPD-01	DD-103	TM5S1	821-01	DC-511		
E	.001			BPD-001	DD-102	TM5D1	801-001	DC-521		
C8	.002	200	920550	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1 Meg	½	390194					Volume & Switch

RESISTORS

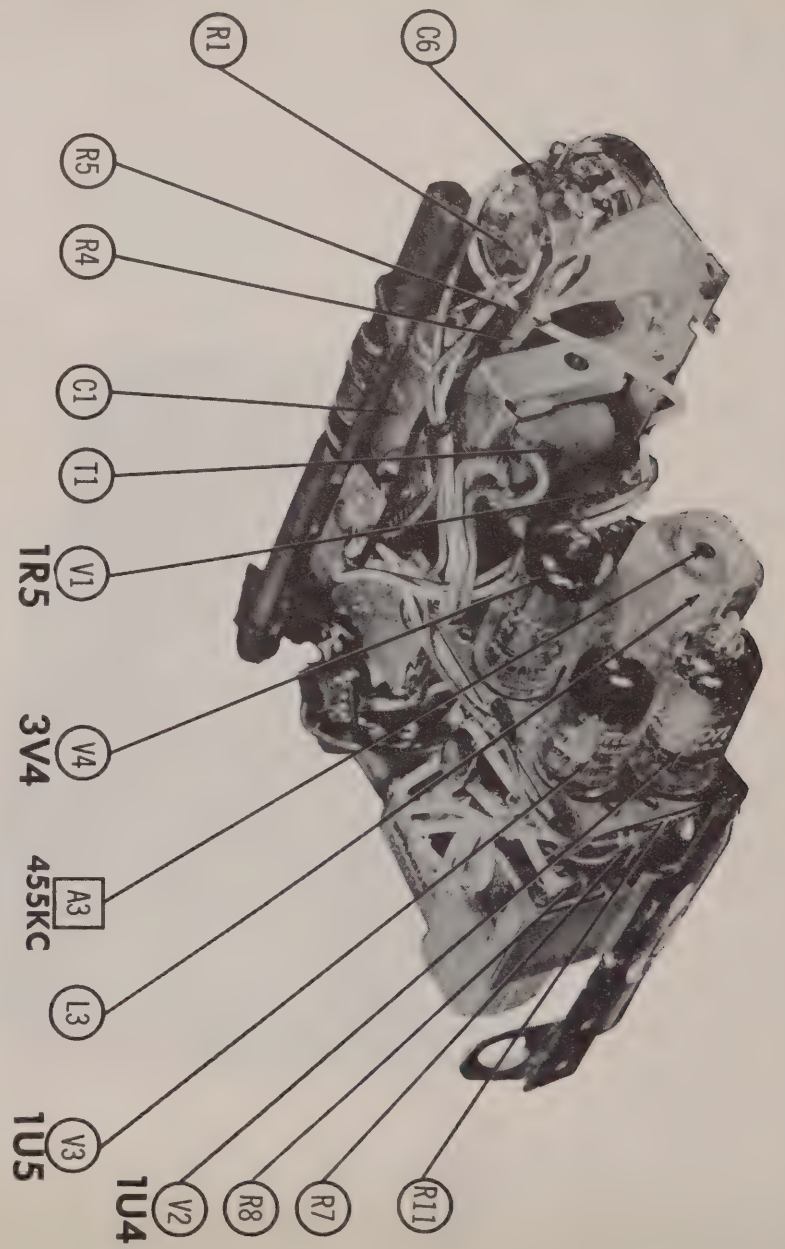
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	100KΩ	½	350972	BTS-100K	
R3	15KΩ	½	340772	BTS-15K	
R4	3.3Meg	½	351332	BTS-3.3Meg	
R5	47KΩ	½	340892	BTS-47K	
R6	10Meg	½	351452	BTS-10Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R7	4.7Meg	½	351372	BTS-4.7Meg	
R8	1 Meg	½	341212	BTS-1 Meg	
R9	3.3Meg	½	351332	BTS-3.3Meg	
R10	470	½	340412	BTS-470	
R11	4.7Meg	½	351372	BTS-4.7Meg	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	9KΩ	3.5Ω	420Ω	.12Ω	734076	A-3329 ①	A-2928 ①		S-11X	① Bend one mtg. tab down, file out slot, mount same as original unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.5Ω	180085	35J4	3A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	EMERSON PART No.	MERIT PART No.	
L1	Loop Ant.	.9Ω		700069		
L2	Osc. Coil	.9Ω	8.2Ω	716072		
L3	Input IF	22Ω	22Ω	720152	BC-352	
L4	Output IF	22Ω	22Ω	720152	BC-353	

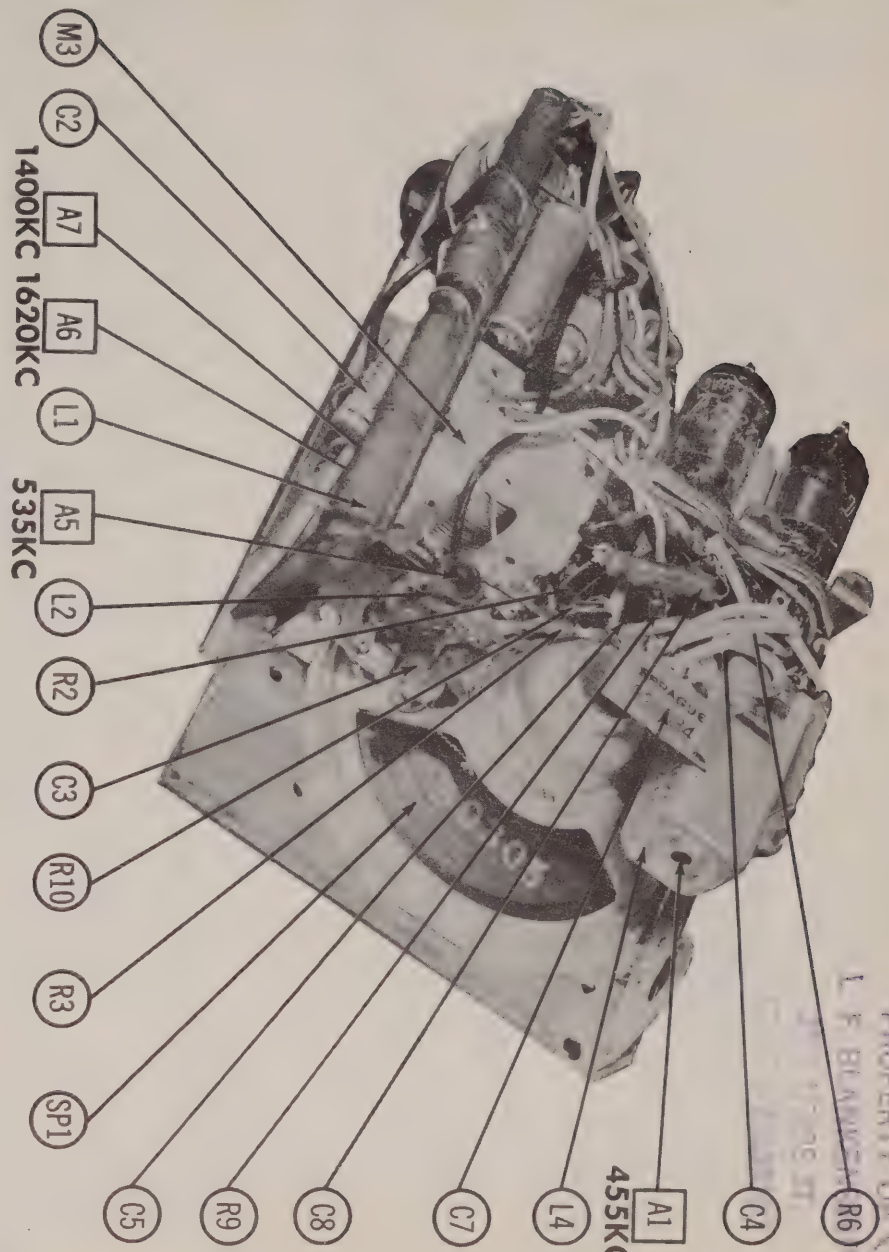
BATTERIES

ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1 M2	1.5V 67.5V		964	477		21R	P45		2 Batteries in parallel

MISCELLANEOUS

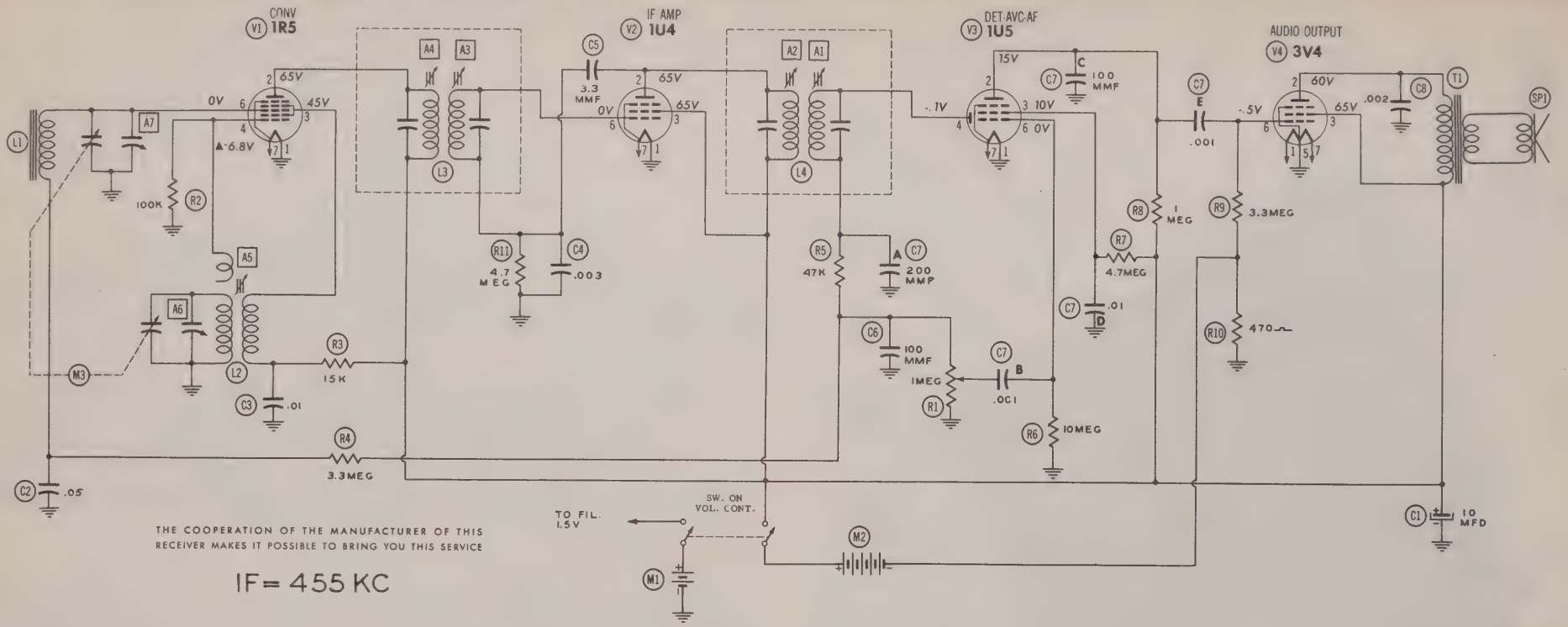
ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	2 Gang Var. Cap.	900085	(8-280MMF, 5-175MMF)
	Knob	460291	Dial
	Knob	450139	Volume

CHASSIS—BOTTOM VIEW



PROPERTY OF

EMERSON
MODEL 704 (Ch. 120154-B)



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF= 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†22Ω	†15KΩ	100KΩ	0Ω	4.3Meg	*
V 2	1U4	0Ω	†22Ω	†0Ω	†0Ω	0Ω	4.7Meg	*
V 3	1U5	0Ω	†1 Meg	†4.7Meg	1 Meg	0Ω	10Meg	*
V 4	3V4	*	†420Ω	†0Ω	470Ω	0Ω	3.3Meg	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM BATTERY B+ LEAD. (BATTERY DISCONNECTED)
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

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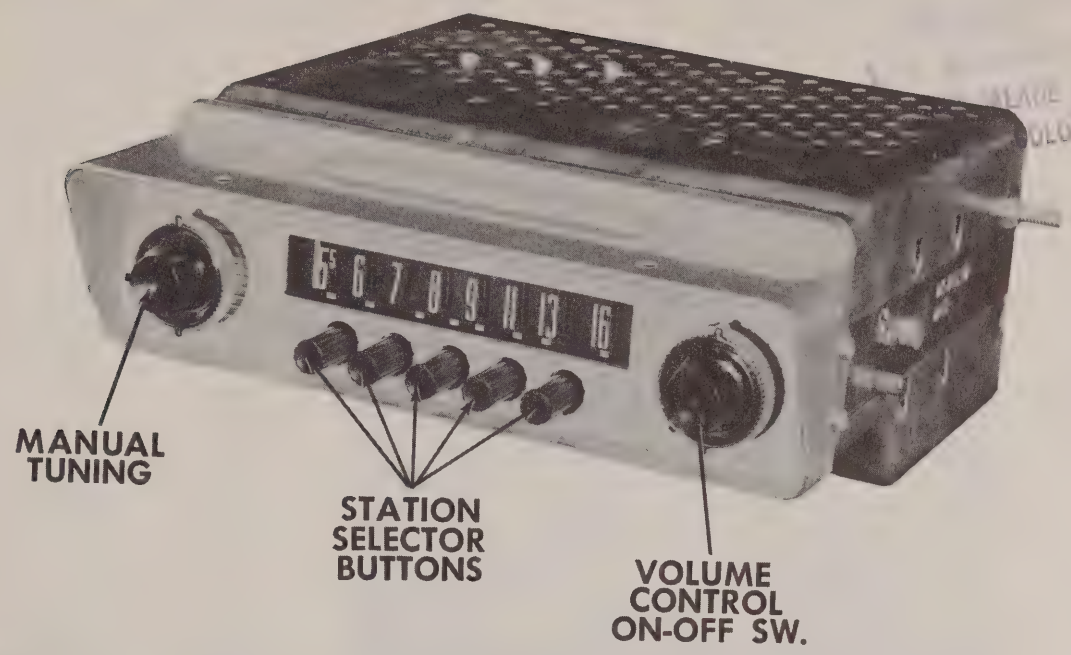
184-6

1 - DC Voltage measurements are at 20, 000 ohms per volts, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.



FORD
MODEL M-4 (FAC-18805-A1)

TRADE NAME	Ford Model FAC-18805-A1 (Serial Prefix 2BF) (Bendix Model M-4) (For 1952 Ford Automobiles)
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore 4, Md.
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6V6GT Audio Output, 6X5GT Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 7 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540 - 1606 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn manual tuning control to set pointer at extreme low frequency end of dial. Pointer should be about 1/4 inch to left of 5.5 marker. Reset pointer if necessary.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fig. 1	Thru dummy to antenna receptacle.	265KC (400~Mod.)	High frequency end of dial.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1606 KC	"	"	A5, A6, A7	"
	The following alignment is necessary only if tuner coil or core is replaced or tampered with.						
3.	Fig. 1	Thru dummy to antenna receptacle	1606 KC	High frequency end of dial.	Across voice coil	A8, A9 A10, A5, A6, A7	Adjust cores A8, A9 and A10 to enter coil forms but not far enough to extend into coils. Adjust A5, A6 and A7 for maximum output.
4.	"	"	1300 KC	1300 KC	"	A8, A9 A10	Adjust for maximum output.
5.	"	"	1606 KC	High frequency end of dial.	"	A5, A6 A7	Adjust for maximum output. Repeat steps 4 and 5 until no change is noted.

SENSITIVITY CONTROL ADJUSTMENT

With set operating, connect a VTVM from adjustable contact of control R2 to chassis and adjust R2 for -1.5 volts on VTVM.

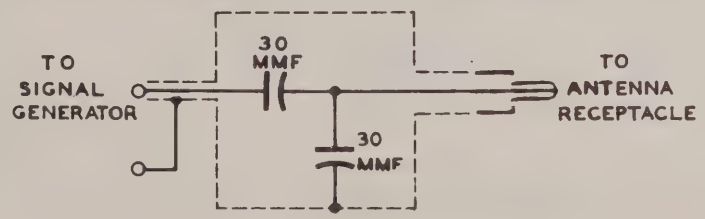


FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		BENDIX PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6V6GT	6V6GT	7AC	
V6	Rectifier	6X5GT	6X5GT	8S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BENDIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	350	C220108-1	AFH3-106		UP2I35C		FP328	TVL-3634	
B	▲10	300								
C	20	25								
C2	120	500	C220099-19							
C3	100		C220099-16	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C4	.1	200	C220098-8	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C5	.1	400	C220098-6	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C6	5		CH267007-047	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C7	1.9		C293168-1							
C8	100		C220099-3	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C9	33		C60454B-330	SI33NP0	TCZ-33		NP0K-330	ZT-5433	5TCC-Q33	
C10	22		C●220099-18	SI22	D6-220	5W5Q25	GP1K-220	UC-5422	5GA-Q22	
C11	.02	200	C220098-4	P488-02	DF-203	PJ2S5		PT412	2TM-S2	
C12	.015	400	C220098-19	P488-015		PTE6S15		TP400	6TM-S15	
C13	.004	400	C220098-18	P688-004	D6-402	PTE6D4	GP2-333-402	PT624	6TM-D4	
C14	.015	400	C220098-19	P488-015		PTE6S15		TP400	6TM-S15	
C15	.002	600	C220098-11	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C16	.004	1600	C220098-17	P1688-004		PTE16D4		PT1624	MB-D4	
C17	.5	100	C220098-10	P185-5		MP2P5			68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BENDIX PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	C219586-3					Tone-Panel
B	500K	½						Volume-Tap ⑨ 130KΩ -Rear
R2	125	1	C219555-6					Sensitivity-Wire Wound-Note

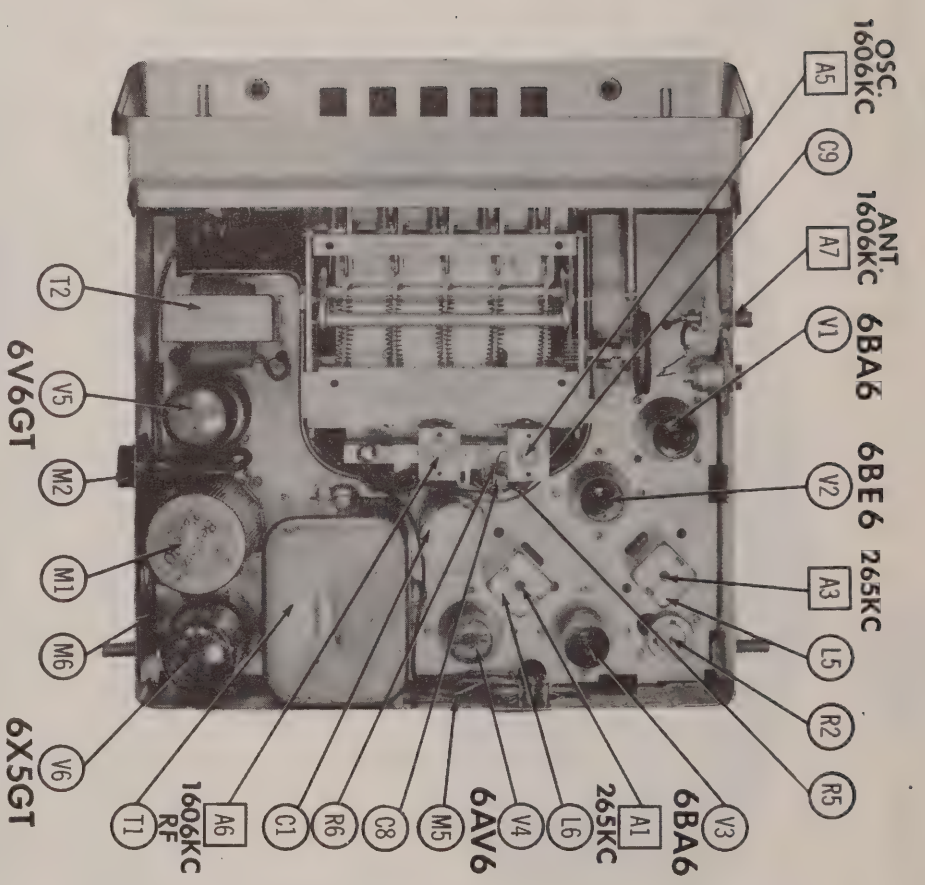
Note. Control has 16Ω stop.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BENDIX PART No.	IRC PART No.	
R3	470KΩ	½	C220551A-474M	BTS-470K	
R4	10KΩ	1	" C-103K	BTA-10K	
R5	100Ω	½	" A-101M	BTS-100	
R6	47KΩ	½	" A-473M	BTS-47K	
R7	2.2Meg	½	" A-225M	BTS-2.2Meg	
R8	15KΩ	2	" D-153M	BTB-15K	
R9	220Ω	½	" ●A-221M	BTS-220	
R10	100KΩ	½	" A-104M	BTS-100K	
R11	470KΩ	½	" A-474M	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BENDIX PART No.	IRC PART No.	
R12	10Meg	½	" A-106M	BTS-10Meg	
R13	470KΩ	½	" A-474M	BTS-470K	
R14	18KΩ	½	" A-183K	BTS-18K	
R15	180Ω	½	" A-181K	BTS-180	
R16	82Ω	½	" A-820K	BTS-82	
R17	100KΩ	½	" A-104M	BTS-100K	
R18	1000Ω	1	" C-102K	BTA-1000	
R19	82Ω	½	" A-820K	BTS-82	
R20	82Ω	½	" A-820K	BTS-82	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	BENDIX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC @ 7A	500VCT .048ADC			C-217453-1	P-6476 ①	P-4071		

① Drill new mtg. hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		BENDIX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	6KΩ	3.2Ω	630Ω	.7Ω	C-217465	A-3850 ①			S-5X	① Drill new mtg. hole

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	BENDIX PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6" x 9"	EM 6Volt	3.4Ω	1A-18808-02 L-208263 ①	ST-814 Mod. F69-T	69EV6	① Alternate speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	BENDIX PART No.	MERIT PART No.	
L1	Ant. Coil	12Ω		C216053-1		Includes slug, part #C215681-1
L2	RF Choke	25Ω				Wound on 56KΩ resistor.
L3	RF Coil	11.5Ω		C216051-1		Includes slug, part #C215681-1
L4	Osc. Coil	1.7Ω	3.6Ω	C216052-1		Includes slug, part #C215681-2
L5	Input IF	48Ω	57Ω	L291714-1 *	BC-350 BC-354	* Alternate part #L291714-2-3
L6	Output IF	50Ω	35Ω	L291706-2 †		† Alternate part #L291706-3-4
L7	Hash Choke	0Ω		C215521-2		
L8	Fil. Choke	0Ω		C215739-2		
L9	Fil. Choke	0Ω		A216015-1		

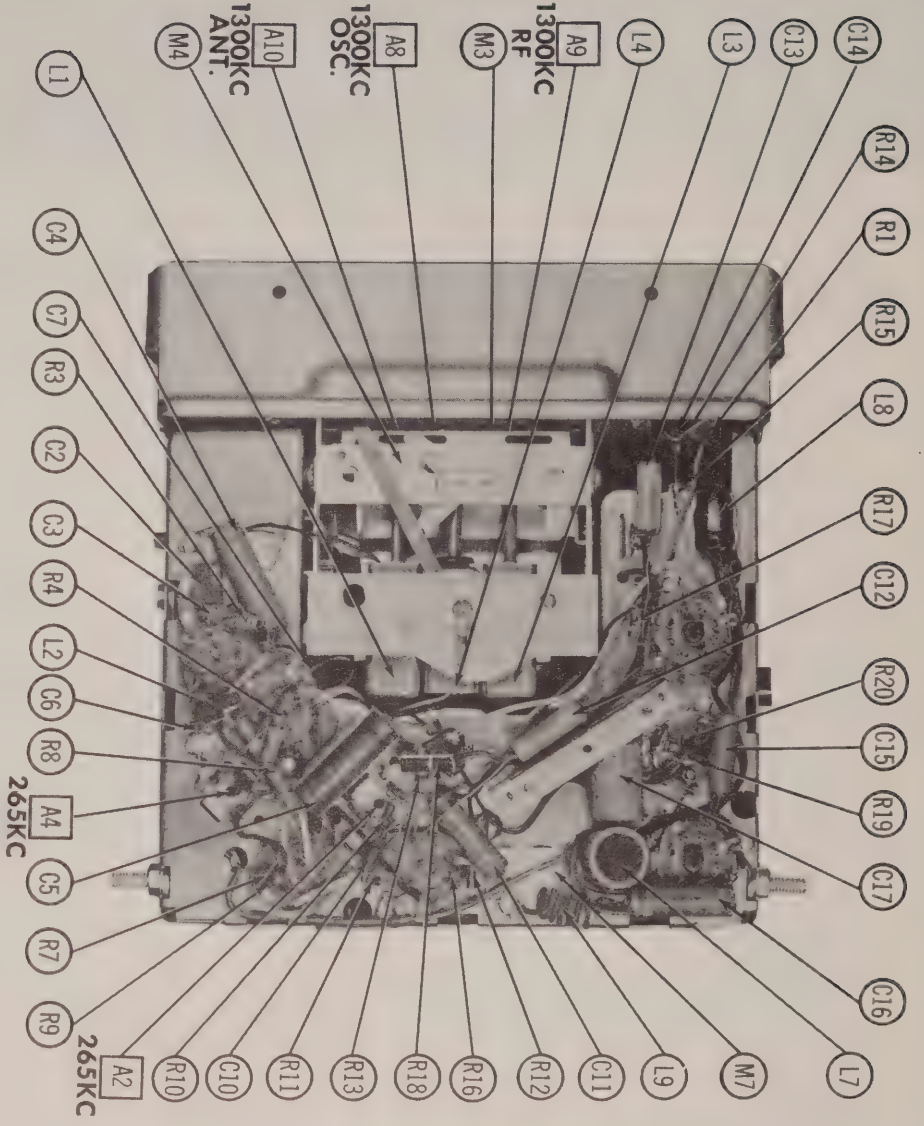
VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				BENDIX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	C-222810-1	5301	859	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BENDIX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
MT	SFE	14A	C221613-14	C233499-1-4-6	307014	157020	SFE-14	HDI

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					BENDIX PART No.		
M3	Bayonet	6-8	.4	White	C221319-2		Type #55

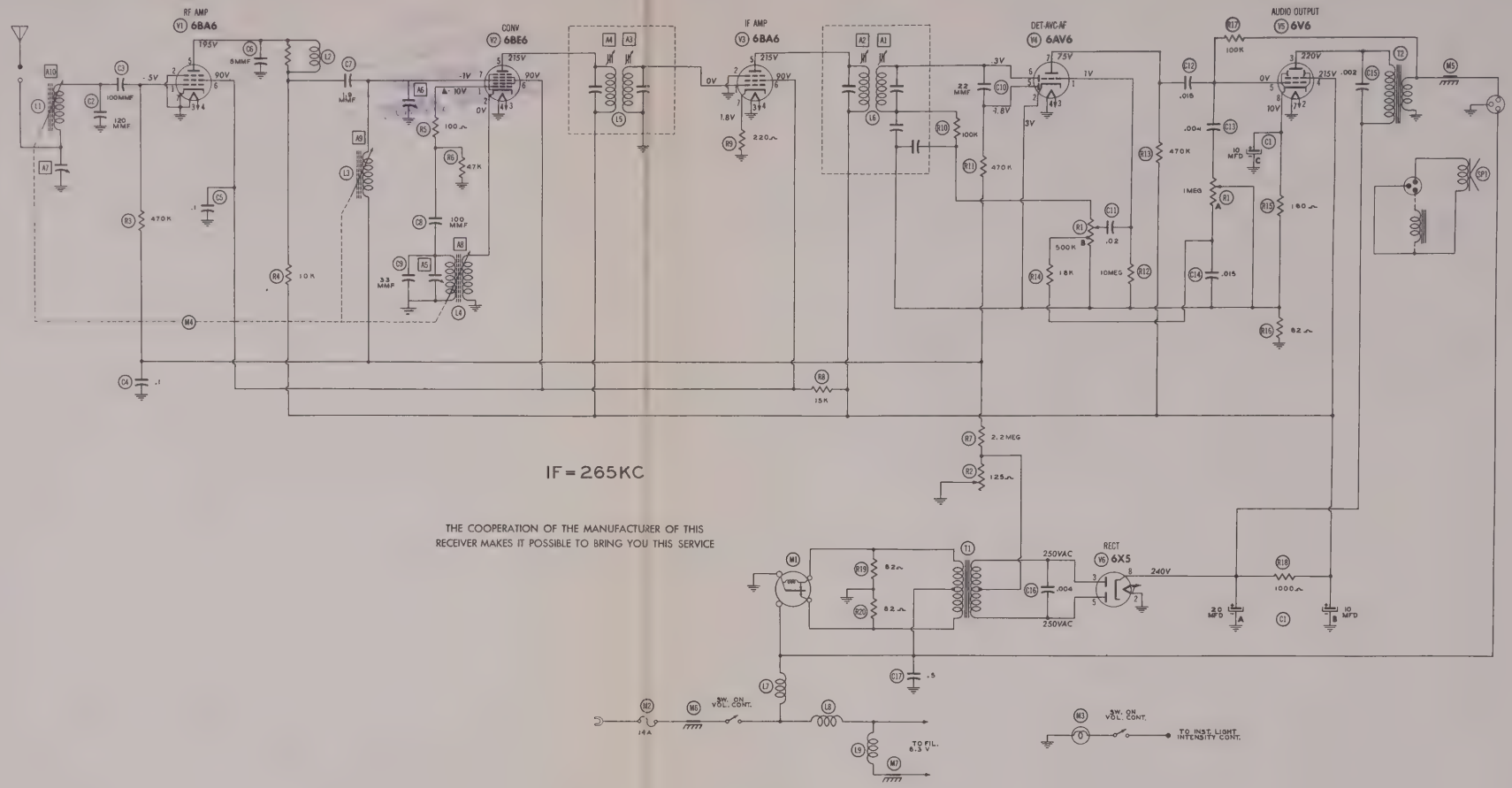
MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M4	Tuner Unit		
M5	Spark Plate	A243398-1	
M6	Spark Plate	A243398-2	
M7	Spark Plate		
A5	Trimmer	C219057-1	Osc. Adj. (430-500MMF)
A6	Trimmer	C219045-9	RF Adj. (4-75MMF)
A7	Trimmer	C219046-2	Ant. Adj. (4-75MMF)
	Knob	C208479-1	Tuning
	Knob	C208480-1	Volume
	Knob	L236294	Tone Disc.
	Dial Scale	L247084	

PUSHBUTTON ADJUSTMENT

To Set Push Buttons:

1. Tune manually to station desired.
2. Loosen push button by turning one turn counter clockwise.
3. Push the button all the way in and release.
4. Tighten button with fingers.
5. Repeat above procedure with remaining buttons.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	2.7Meg	0Ω	0Ω	.4Ω	†11KΩ	†16KΩ	0Ω	
V 2	6BE6	47KΩ	1.7Ω	.4Ω	0Ω	† 1KΩ	†16KΩ	2.2Meg	
V 3	6BA6	48Ω	0Ω	0Ω	.4Ω	†1KΩ	†16KΩ	220Ω	
V 4	6AV6	10Meg	82Ω	.4Ω	0Ω	2.7Meg	600KΩ	†470KΩ	
V 5	6V6GT	0Ω	.4Ω	†630Ω	†1KΩ	100KΩ	.7Ω	0Ω	262Ω
V 6	6X5GT	0Ω	.4Ω	380Ω	INF	320Ω	.4Ω	0Ω	180KΩ

† MEASURED FROM PIN 8 OF V6
▲ TAKEN WITH VACUUM TUBE VOLTMETER

1-DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2-Socket connections are shown as bottom views.
3-Measured values are from socket pin to common negative.
4-Battery voltage maintained at 6.3 volts for voltage readings.
5-Nominal tolerance on component values makes possible a variation of ± 15% in voltage ans resistance readings.
6-Volume control at maximum, no signal applied for voltage measurements.

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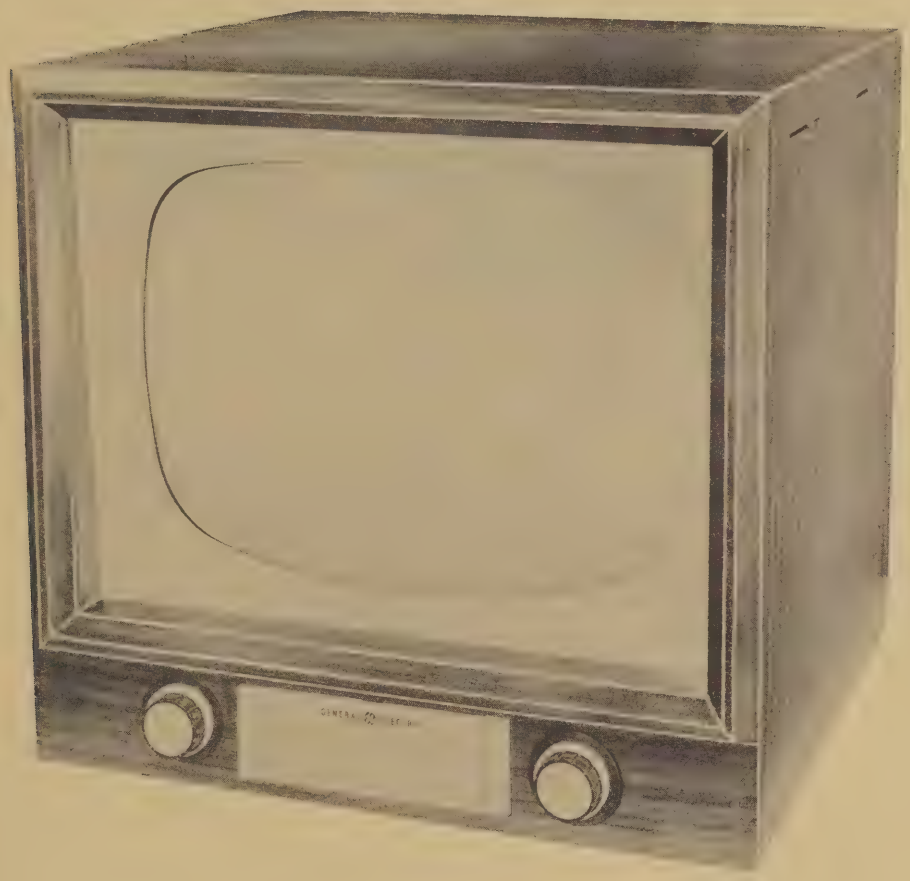

MODEL 21T4

GENERAL ELECTRIC
MODELS 21T4, 21T5

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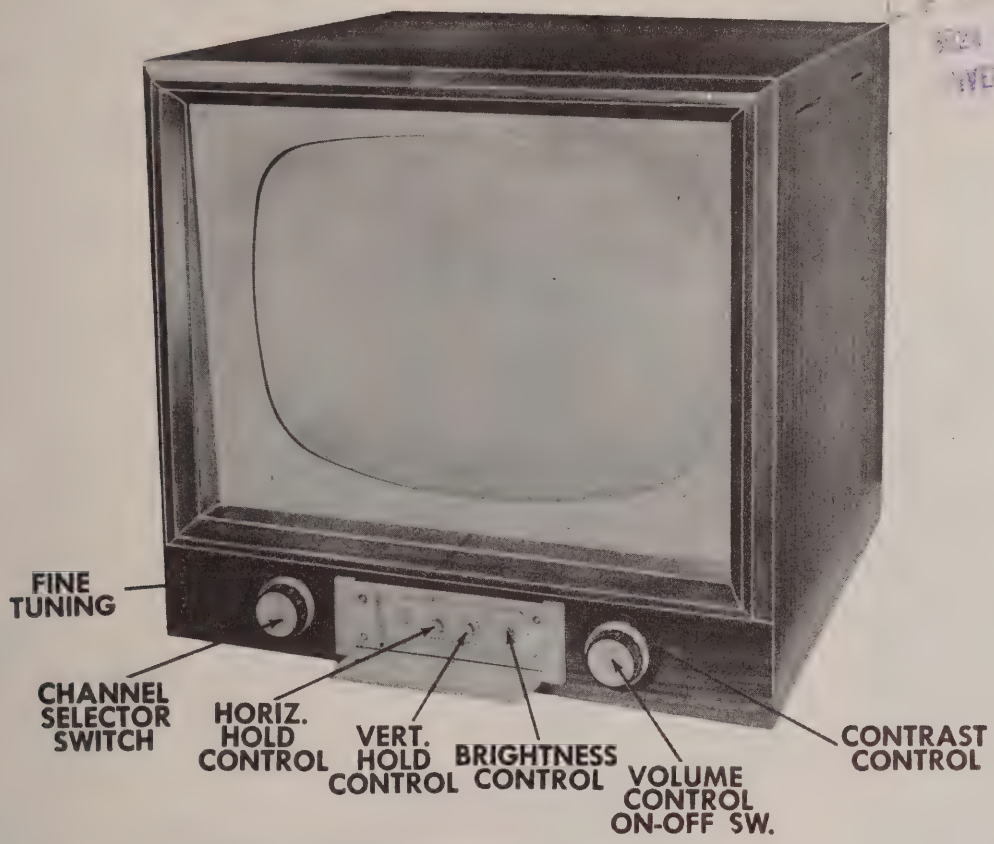

GENERAL ELECTRIC 21T4

TRADE NAME	General Electric Models 21T4, 21T5
MANUFACTURER	General Electric Co,, Electronics Dept., Electronics Park, Syracuse, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycle. RATING 1.74 Amp. @ 117 volts AC
TUNING RANGE—	Channels 2 thru 13

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GENERAL ELECTRIC MODELS 21T4, 21T5

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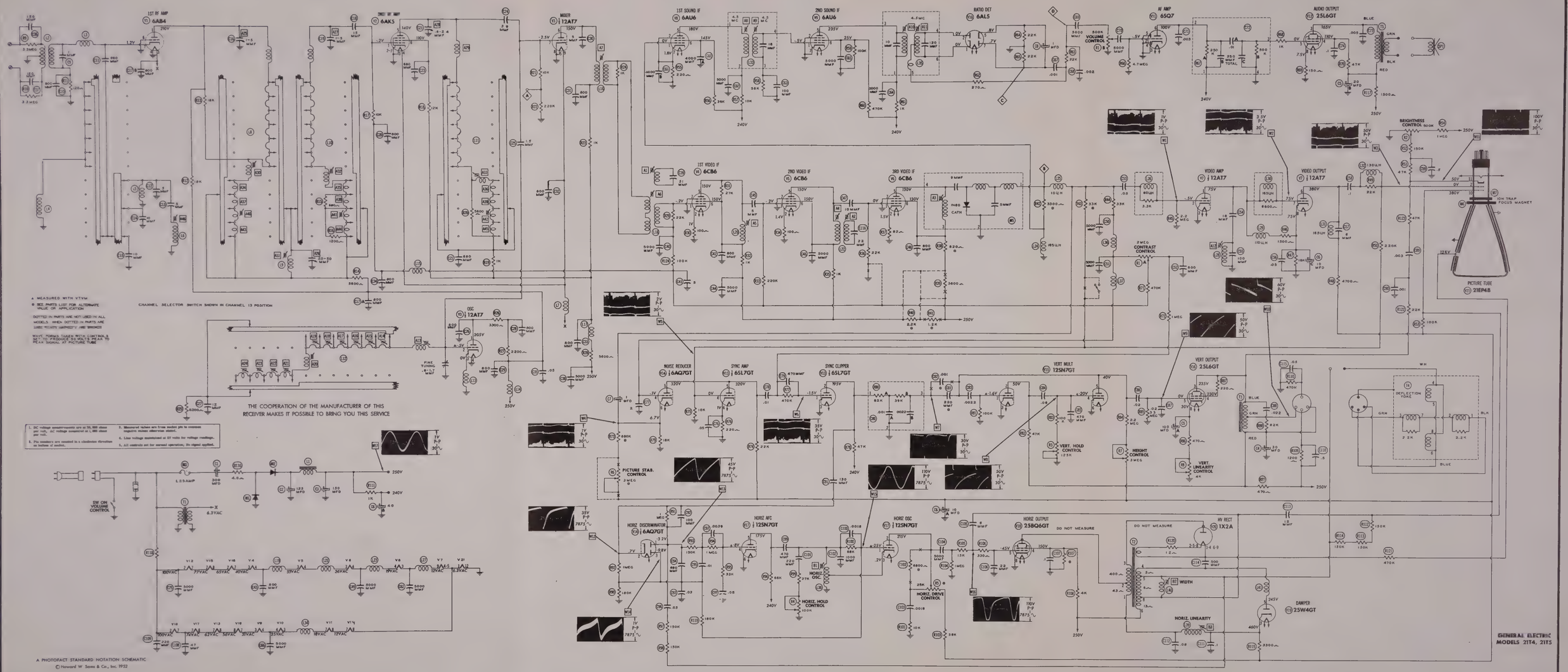
1ST RF AMP V1 6AB4
V2 6AK5
MIXER V3 12AT7
1ST SOUND IF V8 6AU6
2ND SOUND IF V9 6AU6
RATIO DET V10 6AL5
AF AMP V11 6SQ7
AUDIO OUTPUT V12 25L6GT
1ST VIDEO IF V4 6CB6
2ND VIDEO IF V5 6CB6
3RD VIDEO IF V6 6CB6
VIDEO AMP V7 12AT7
VIDEO OUTPUT V7 12AT7
OSC V3 12AT7
NOISE REDUCER V14A 6AQ7GT
SYNC AMP V13 6SL7GT
SYNC CLIPPER V13 6SL7GT
VERT MULT V13 12SN7GT
VERT OUTPUT V14 25L6GT
HORIZ DISCRIMINATOR V14B 6AQ7GT
HORIZ AFC V17 12SN7GT
HORIZ OSC V17 12SN7GT
HORIZ OUTPUT V18 25BQ6GT
HV RECT V20 1X2A
DAMPER V19 25W4GT
PICTURE TUBE V21 21EP4B
VOLUME CONTROL
BRIGHTNESS CONTROL
CONTRAST CONTROL
VERT. HOLD CONTROL
HEIGHT CONTROL
VERT. LINEARITY CONTROL
PICTURE STAB. CONTROL
HORIZ. HOLD CONTROL
HORIZ. DRIVE CONTROL
HORIZ. LINEARITY
WIDTH
ION TRAP FOCUS MAGNET
DEFLECTION YOKE
SW ON VOLUME CONTROL
FINE TUNING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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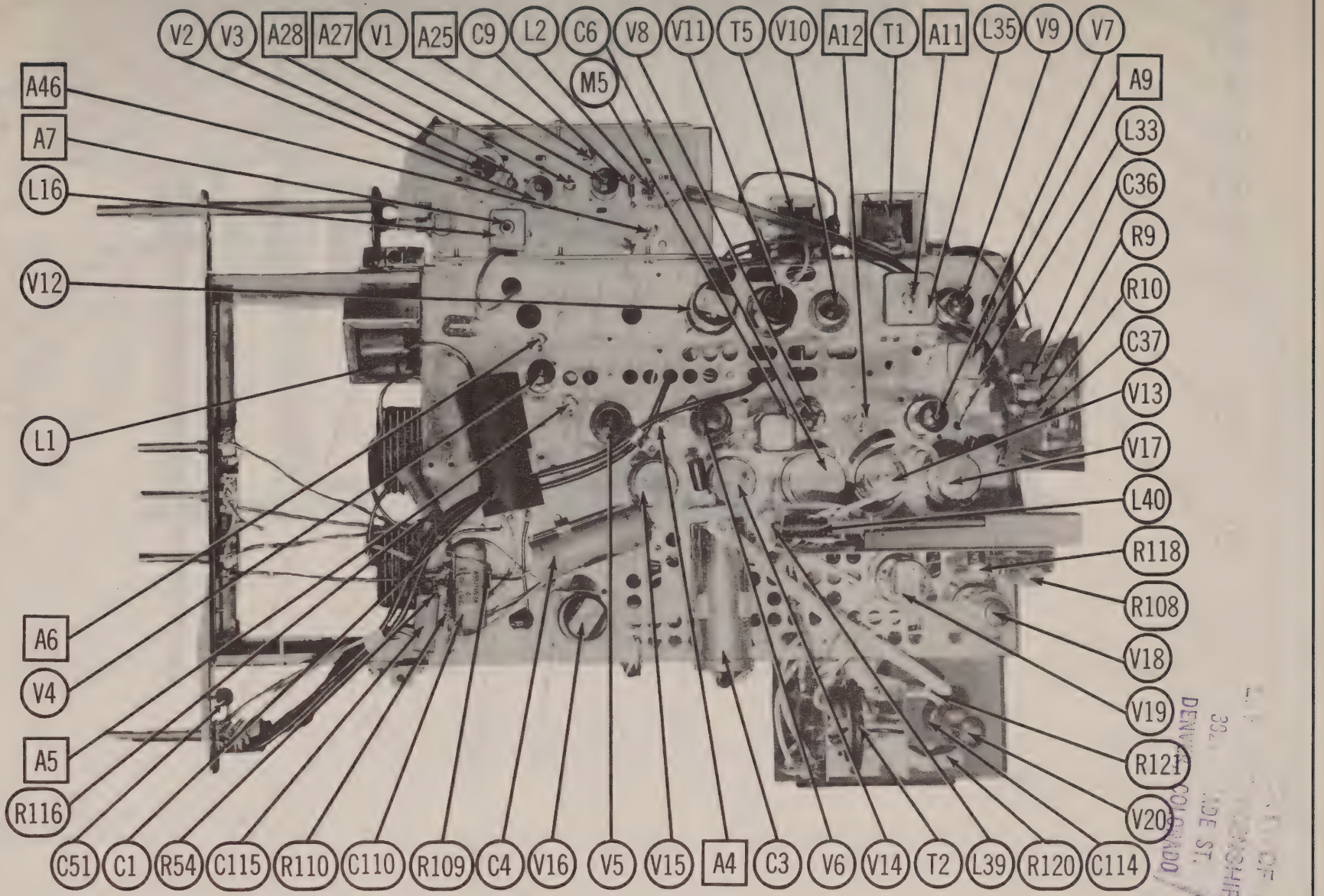
V2
V3
A28
A27
V1
A25
C9
L2
C6
V8
V11
T5
V10
A12
T1
A11
L35
V9
V7
A9
M5
A46
A7
L16
V12
L1
A6
V4
A5
R116
L33
C36
R9
R10
C37
V13
V17
L40
R118
R108
V18
V19
R121
V20
C51
C1
R54
C115
R110
C110
R109
C4
V16
V5
V15
A4
C3
V6
V14
T2
L39
R120
C114

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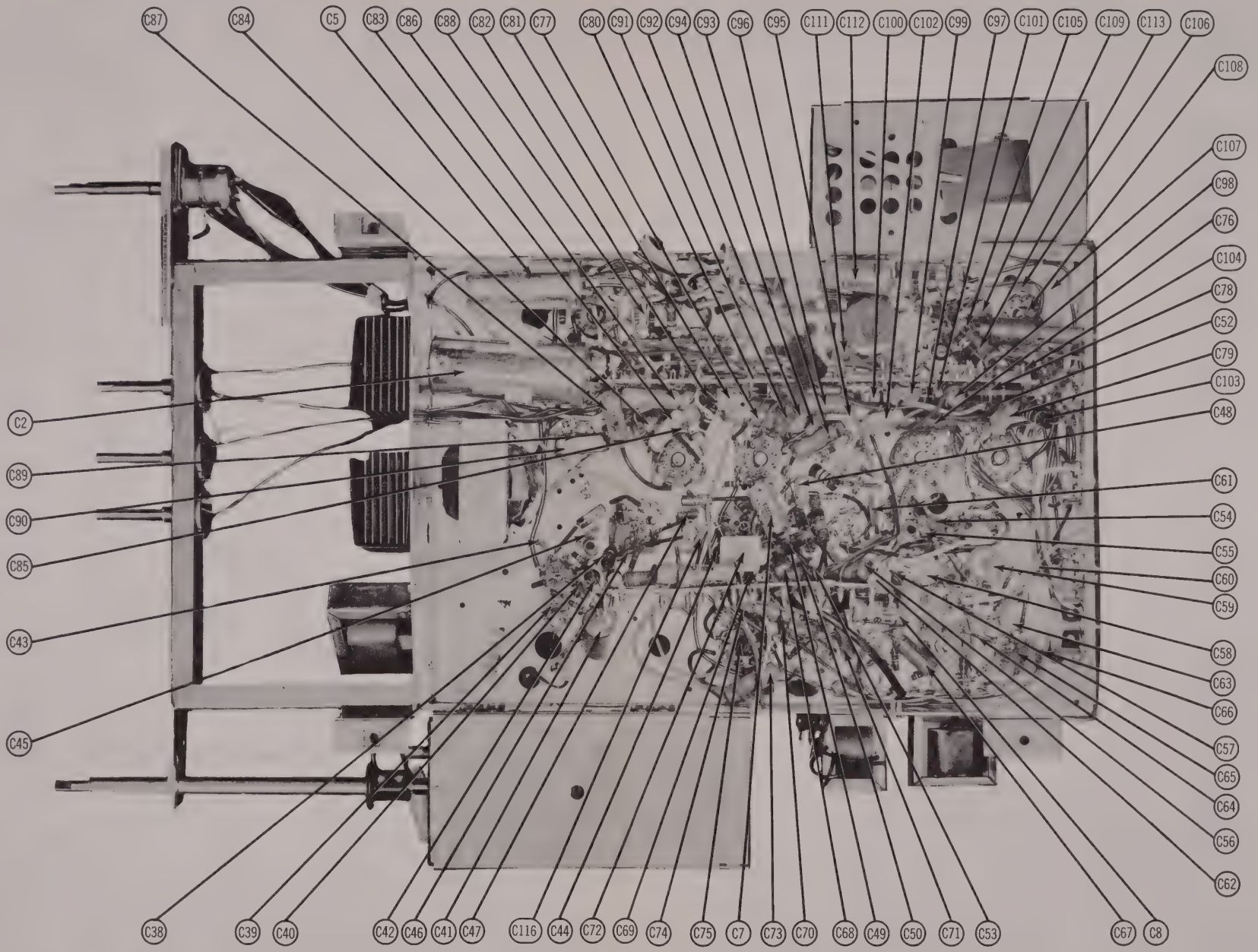
DENVER, COLORADO



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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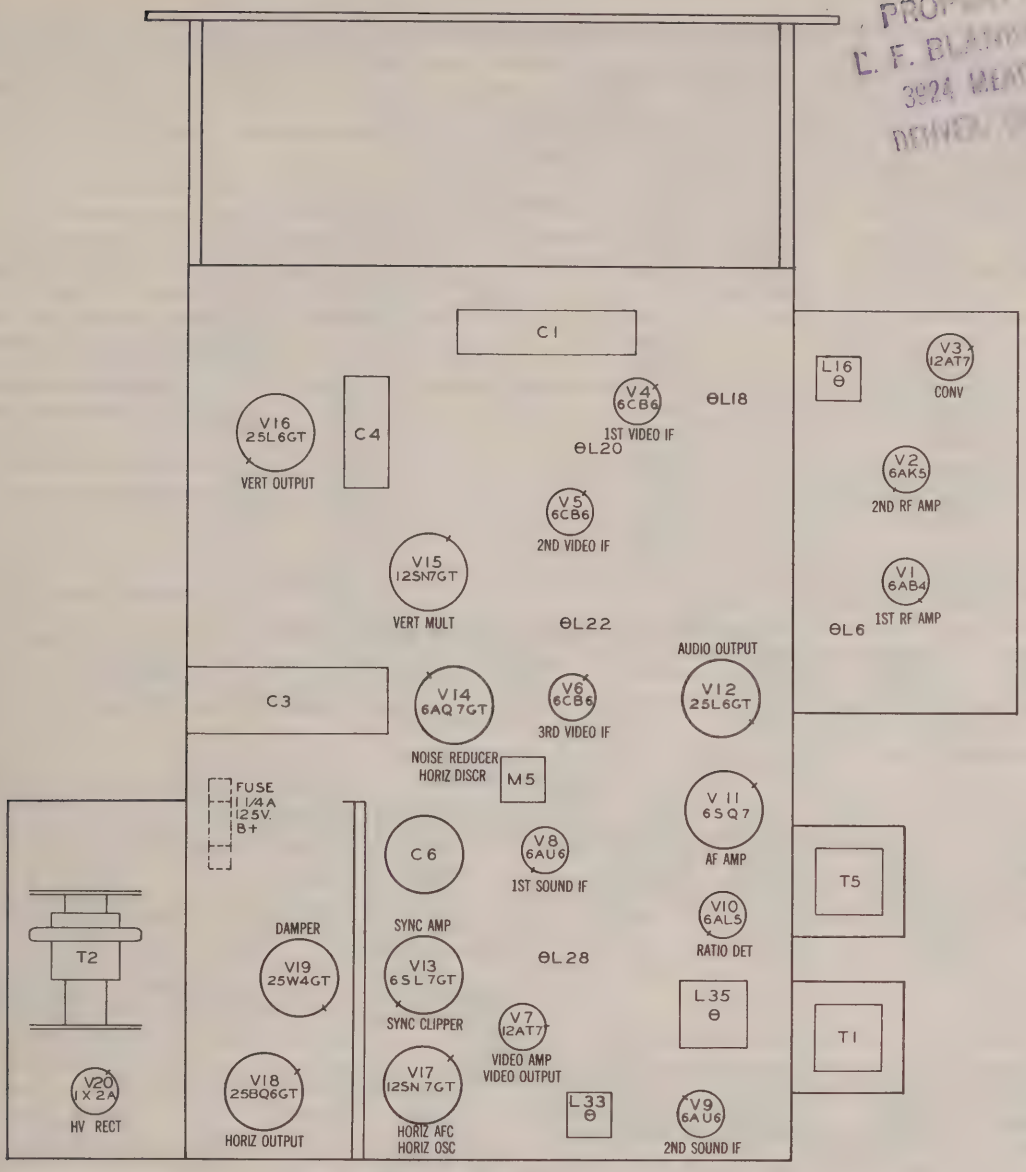
DENVER, COLORADO



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-Selenium Rectifiers (M1, M2) Fuse (M3)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6
No pic, no sound, has snow-V1, V2, V3, V4
No pic, has sound, has raster-V7, V21
Has pic, no sound-V8, V9, V10, V11, V12

SYNC FAILURE
No vert. sync. -V13, V15
No horiz. sync. -V13, V14, V17
No vert. or horiz. -V13, V14

SWEEP FAILURE
No raster, has sound-V17, V18, V19, V20, V21
No vertical deflection-V16
Poor vert. linearity or foldover-V15, V16
Poor horiz. linearity or foldover-V17, V18, V19
Narrow picture-V17, V18, V19, V20, M1, M2
Vert. off freq. -V15
Horiz. off freq. -V13, V14, V17

Note. Since this receiver employ tubes used in a series parallel filament network, an open filament in any tube in series may cause the set to be inoperative.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage. Use isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of C52 and R1A (contrast control).
Connect the positive lead to chassis. Adjust the contrast control to give -3 volts at pin 1 of V4 as measured with a VTVM.
Set the channel switch to channel 11 and turn the fine tuning control fully counter clockwise.
Turn the picture stabilizer control fully counter clockwise.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	100MMF	High side to point (A). Low side to chassis.	44MC (10MC Swp)	47.25MC	11	Vert. amp. to point (B). Low side to chassis.	A1, A2	Use high scope gain. Adjust for MINIMUM marker response at 47.25MC.
2.	.01MFD	High side to pin 1 (grid) of 6CB6 (V6). Low side to chassis.	"	42.50MC 44.10MC 45.75MC	"	"	A3	Short across terminals 3 and 4 of M5. Adjust A3 for response of fig. 1.
3.	"	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.		41.25MC 42.50MC 45.00MC 45.75MC	"	"	A4	Short across L20 and adjust A4 for response as in fig. 2.
4.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	"	41.25MC 42.50MC 45.00MC 45.75MC 47.25MC	"	"	A5	Adjust for response as in fig. 3.
5.	100MMF	High side to point (A). Low side to chassis.	"	"	"	"	A6, A7 A3	Adjust for response as in fig. 4.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 1 (grid) of 6AU6 (V8). Low side to chassis.	4.5MC (Unmod)	11	DC probe to point (C) Common to chassis.	A8, A9, A10	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point (D) Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth volate in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.1MFD	High side to pin 1 (Grid) of 6AU6 (V8) Low side to chassis.	4.5MC (450KC Swp)	4.5MC	11	Vert. amp. thru 10KΩ to point (C) Low side to chassis.	A8, A9, A10	Disconnect stabilizer capacitor C8. Adjust for curve of maximum amplitude and symmetry as in fig. 5.
7.	"	"	"	"	"	Vert. amp. thru 10KΩ to point (D) Low side to chassis.	A11	Reconnect capacitor C8. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 6. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to point (B) Low side to chassis.	4.5MC (2MC Swp)	4.5MC	11	Vert amp. thru detector probe (fig. 7) to junction of L32 and C58 Low side to chassis.	A12	Adjust for MINIMUM 4.5MC marker amplitude.

OSCILLATOR ALIGNMENT

Connect bias battery as in VIDEO IF Alignment.
Disconnect the 300Ω transmission line between antenna and RF terminals and connect the sweep generator to the RF terminals through the matching pad shown in fig. 8.
Set the fine tuning knob ¼ turn from counter clockwise.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Fig. 8	Thru dummy to RF terminals on tuner.	213MC (10MC Swp)	211.25MC	13	Vert. amp. thru 10KΩ to point (B). Low side to chassis.	A13	Adjust to place the video marker at 50% on the high frequency side of the response curve.
			207MC (10MC Swp)	205.25MC	12		A14	
			201MC (10MC Swp)	199.25MC	11		A15	
			195MC (10MC Swp)	193.25MC	10		A16	
			189MC (10MC Swp)	187.25MC	9		A17	
			183MC (10MC Swp)	181.25MC	8		A18	
			177MC (10MC Swp)	175.25MC	7		A19	
			85MC (10MC Swp)	83.25MC	6		A20	
			79MC (10MC Swp)	77.25MC	5		A21	
			69MC (10MC Swp)	67.25MC	4		A22	
			63MC (10MC Swp)	61.25MC	3		A23	
			57MC (10MC Swp)	55.25MC	2		A24	

ALIGNMENT INSTRUCTIONS (CONT.)

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RF AND MIXER ALIGNMENT

Connect bias battery and sweep generator as in Oscillator alignment.
Disconnect the B+ supply wire to the oscillator section of V3.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Fig. 8	Thru dummy to RF terminals on tuner.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A25, A26 A27, A28	Adjust for maximum gain and proper bandwidth as in fig. 9A.
11.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A29	Check for response curve similar to fig. 9A. If necessary dress A29 for desired response curve.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
12.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A30, A31 A32, A33	Adjust for maximum gain, optimum curve flatness and proper bandwidth as in fig. 9B
13.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A34, A35 A36	Compress or expand A34, A35 and A36 if necessary for response as in fig. 9B.
14.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A37, A38 A39	Compress or expand A37, A38 and A39 if necessary for response as in fig. 9B.
15.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A40, A41 A42	Adjust for maximum gain and optimum curve flatness as in fig. 9B.
16.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A43, A44 A45	Compress or expand if necessary for response as in fig. 9B.

IF TRAP ALIGNMENT

The tuner is provided with a trap for the elimination of interference in the If range.
Tune to the channel on which interference is noted and adjust A46 for minimum interference.
Do not adjust A46 so that it will attenuate channel 2.

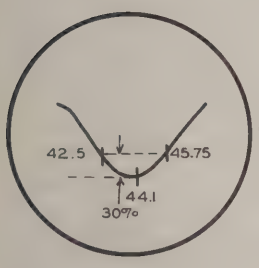


FIG. 1

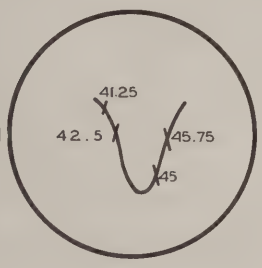


FIG. 2

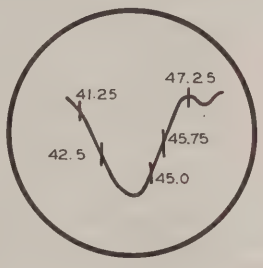


FIG. 3

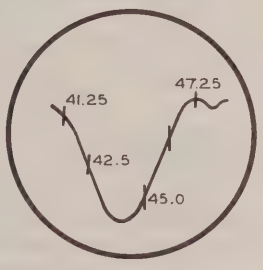


FIG. 4

FIG. 5

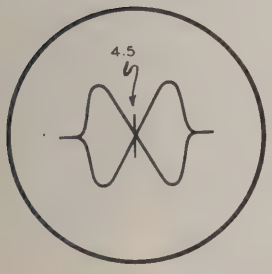


FIG. 6

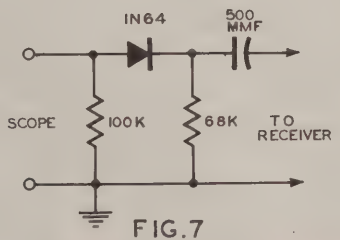
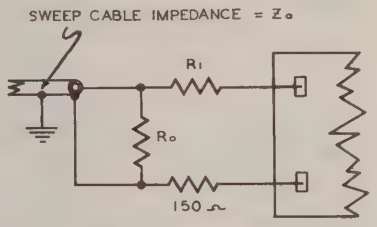


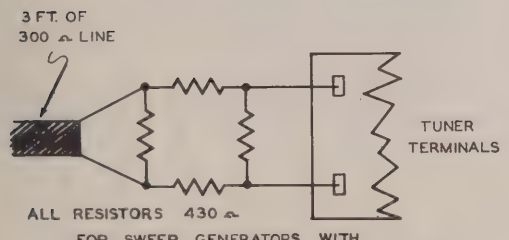
FIG. 7



FOR SWEEP GENERATORS WITH UNBALANCED OUTPUT
FIG. 8

Zo	Ro	R1
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω
92Ω	110Ω	100Ω

FIG. 8



FOR SWEEP GENERATORS WITH BALANCED OUTPUT
FIG. 8

FIG. 9A

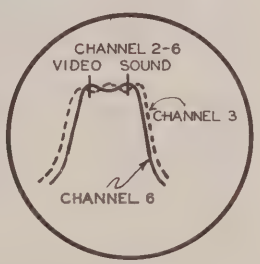
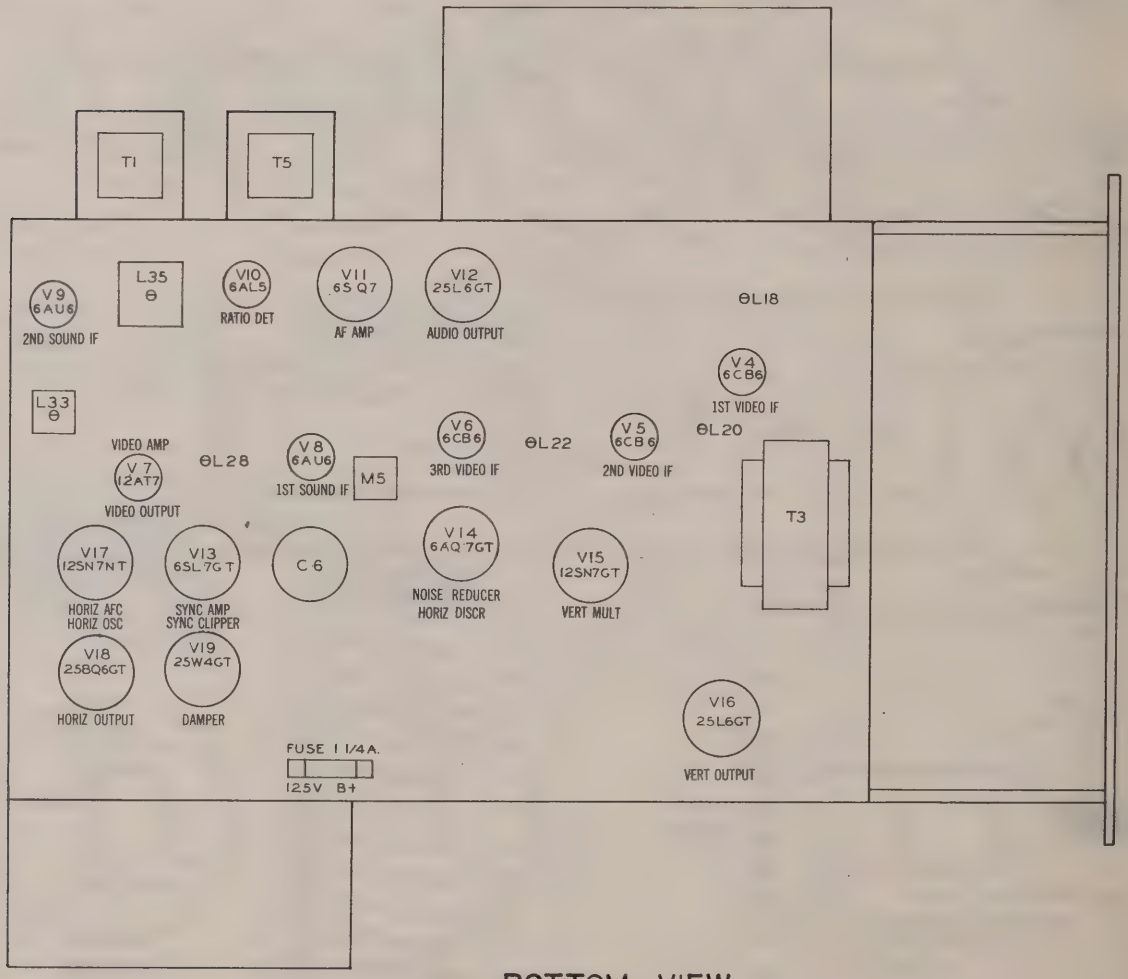


FIG. 9B

RESISTANCE MEASUREMENTS

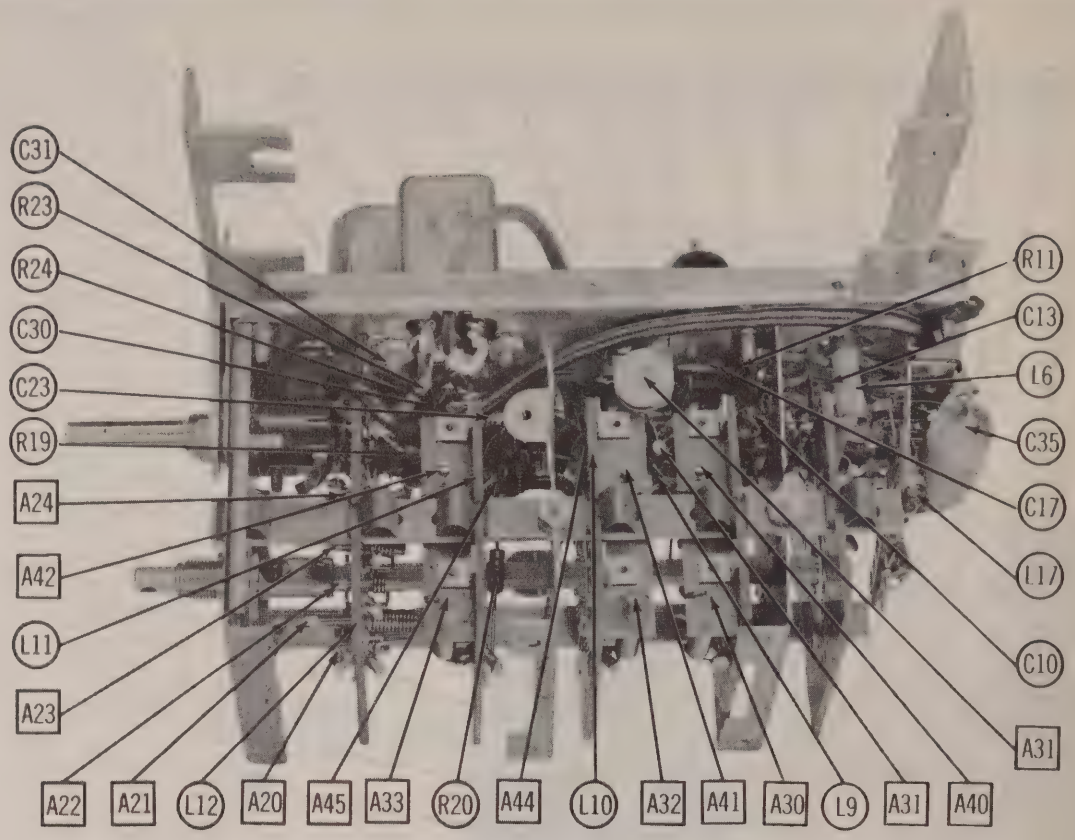
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AB4	†4.2KΩ	0Ω	1.1Ω	0Ω	†41Ω	0Ω	120Ω		
V 2	6AK5	1.4Meg	0Ω	0Ω	1.1Ω	†6.6KΩ	†17KΩ	0Ω		
V 3	12AT7	†5.5KΩ	8.2KΩ	.1Ω	0Ω	0Ω	†6.6KΩ	230KΩ	0Ω	1.1Ω
V 4	6CB6	1.5Meg	100Ω	18Ω	17Ω	†4.4KΩ	†4.4KΩ	0Ω		
V 5	6CB6	1.6Meg	100Ω	16Ω	14Ω	†4.4KΩ	†4.4KΩ	0Ω		
V 6	6CB6	22KΩ	82Ω	13Ω	11Ω	†6.4KΩ	†6.4KΩ	0Ω		
V 7	12AT7	19KΩ	2.2Meg	0Ω	1.8Ω	1.8Ω	#8KΩ	19KΩ	18KΩ	4.7Ω
V 8	6AU6	5.5Ω	220Ω	6.3Ω	10Ω	†11KΩ	†40KΩ	220Ω		
V 9	6AU6	56KΩ	0Ω	14Ω	12Ω	†2KΩ	82KΩ	0Ω		
V 10	6AL5	INF	INF	9Ω	12Ω	22KΩ	INF	22KΩ		
V 11	6SQ7	0Ω	4.7Meg	0Ω	0Ω	0Ω	†250KΩ	8Ω	5Ω	
V 12	25L6GT	INF	25Ω	†1.7KΩ	†48KΩ	500KΩ	0Ω	23Ω	150Ω	
V 13	6SL7GT	3.5Meg	†48KΩ	0Ω	10KΩ	#25KΩ	220Ω	21Ω	19Ω	
V 14	6AQ7GT	2.1Meg	1.1Meg	100KΩ	36KΩ	#25KΩ	18KΩ	5Ω	1.8Ω	
V 15	12SN7GT	100KΩ	†47KΩ	0Ω	150KΩ	#3.7Meg	0Ω	23Ω	22Ω	
V 16	25L6GT	INF	22Ω	†668Ω	†888	3.3Meg	0Ω	18Ω	1.6KΩ	
V 17	12SN7GT	68KΩ	#65KΩ	50Ω	3.2Meg	†69KΩ	0Ω	22Ω	21Ω	
V 18	25BQ6GT	1 Meg	25Ω	INF	†4KΩ	1 Meg	INF	22Ω	0Ω	TopCap #58Ω
V 19	25W4GT	INF	INF	100KΩ	†150KΩ	†60Ω	INF	14Ω	19Ω	
V 20	1X2A	PINS 1 - 9 HAVE INF RESISTANCE								TopCap #458Ω
V 21	21EP4B	1.8Ω	230KΩ	Pin 10 #100KΩ	Pin 11 420KΩ	Pin 12 0Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM OUTPUT OF M2
# MEASURED FROM PIN 3 OF V19

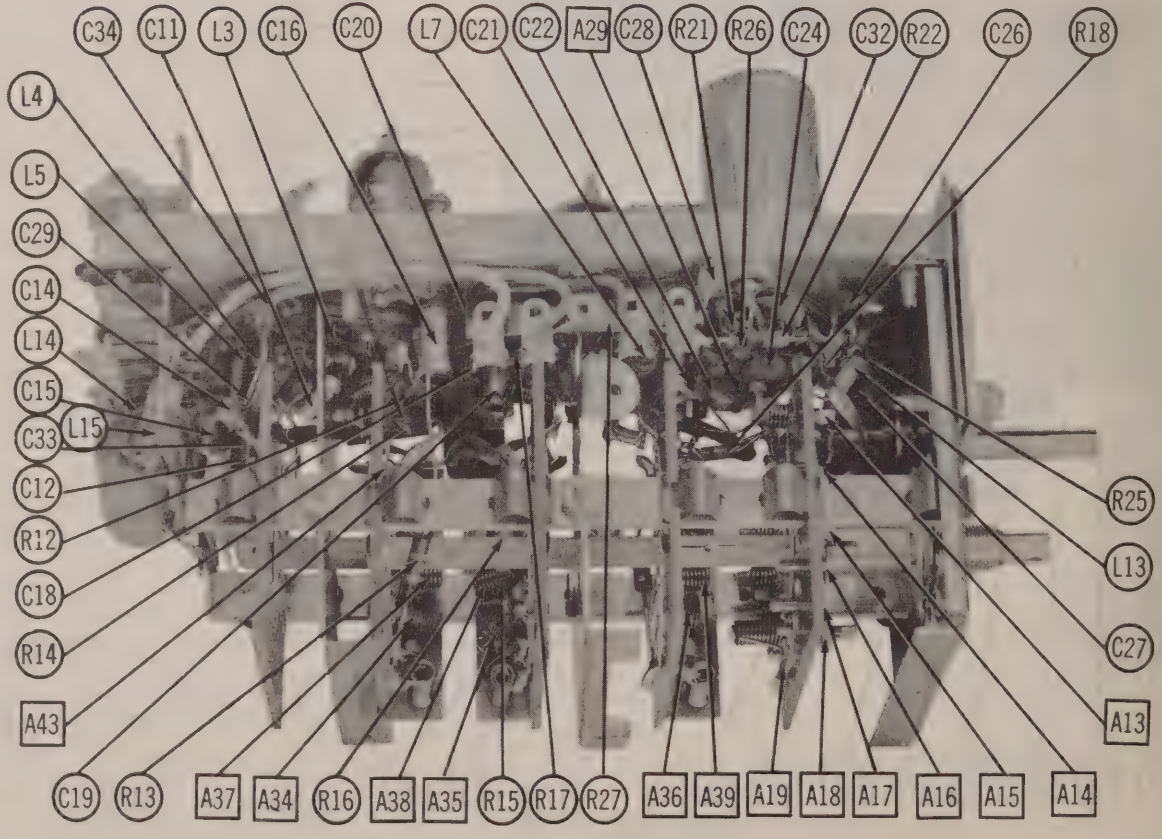


BOTTOM VIEW

TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

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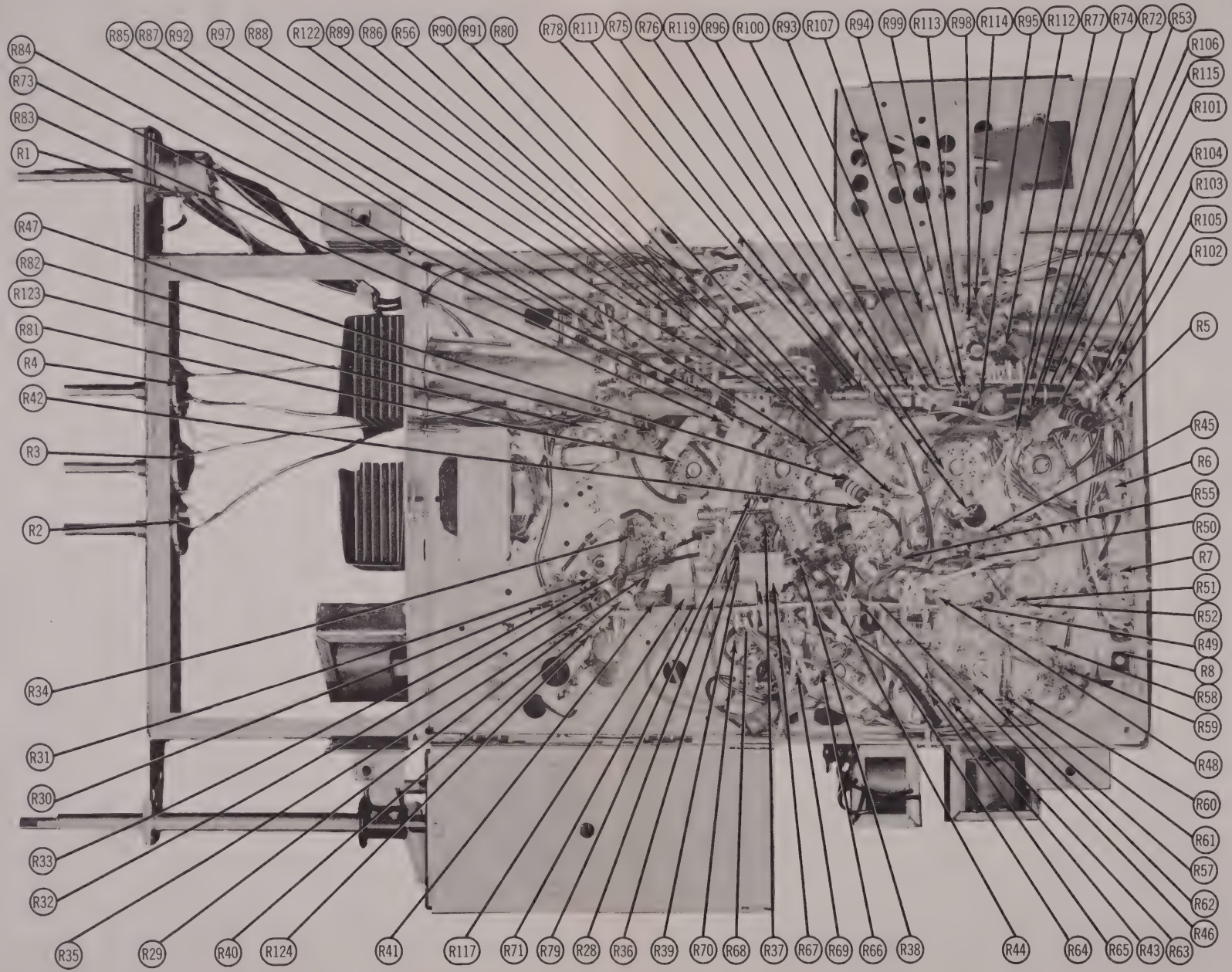
L. F. [illegible] SHIP,
[illegible] E ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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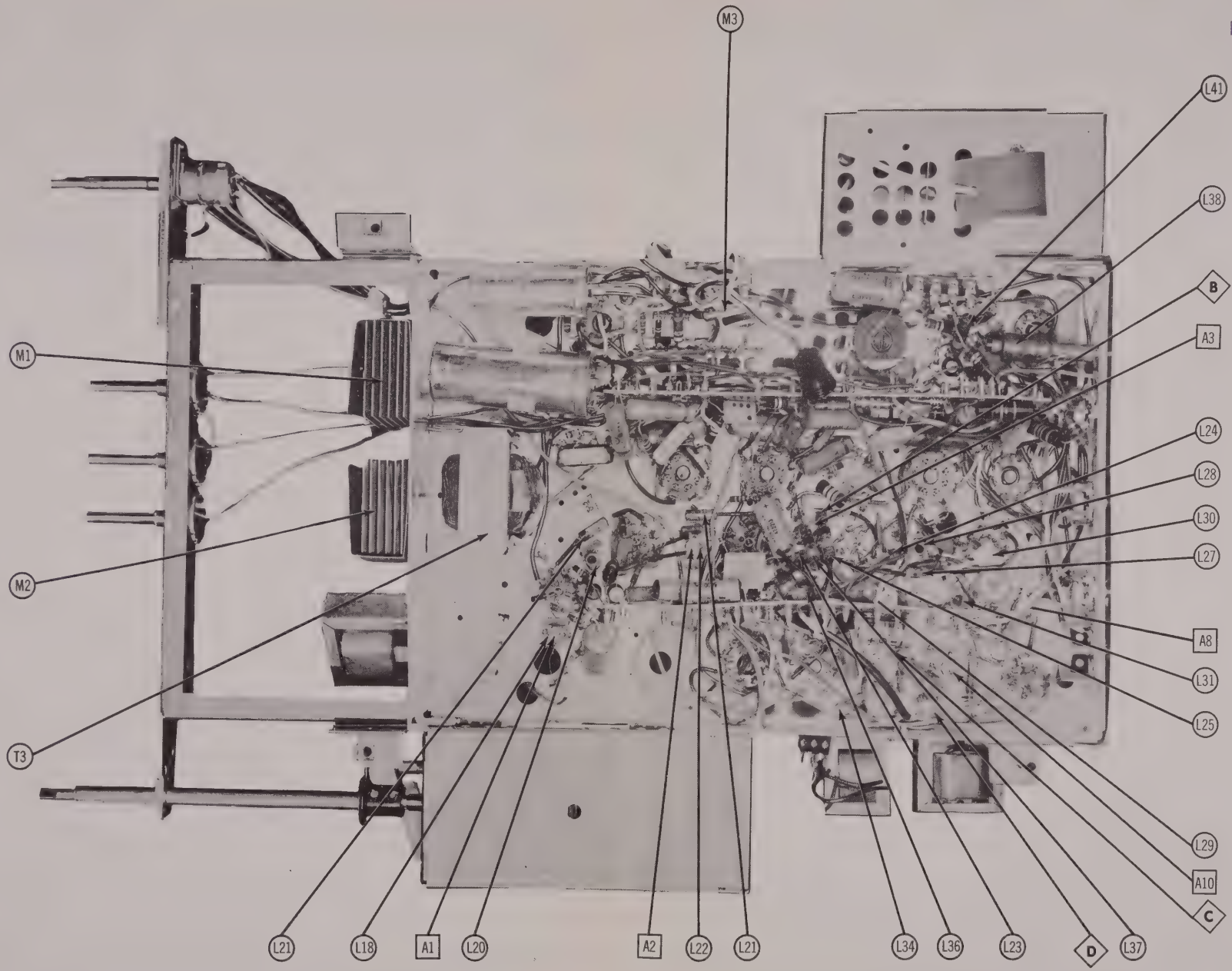


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: General Electric PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	1st. RF Amplifier	6AB4	6AB4	5CE	
V2	2nd. RF Amplifier	6AK5	6AK5	7BD	
V3	Converter	12AT7	12AT7	9A	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Amplifier-Video Output	12AT7	12AT7	9A	
V8	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V9	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6SQ7	6SQ7	8Q	
V12	Audio Output	25L6GT	25L6GT	7AC	
V13	Sync Amplifier-Sync Clipper	6SL7GT	6SL7GT	8BD	
V14	Noise Reducer-Horiz. Discr.	6AQ7GT	6AQ7GT	8CK	
V15	Vert. Mult.	12SN7GT	12SN7GT	8BD	
V16	Vert. Output	25L6GT	25L6GT	7AC	
V17	Horiz. AFC-Horiz. Oscillator	12SN7GT	12SN7GT	8BD	
V18	Horiz. Output	25BQ6GT	25BQ6GT	6AM	
V19	Damper	25W4GT	25W4GT	4CG	
V20	HV Rectifier	1X2A	1X2A	9Y	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: General Electric PART No.	SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V21	21EP4B			12D	① Circuit changes necessary.
		21EP4 ①		12D	
		21EP4A		12D	
		21FP4 ①		12C	
		21FP4A ①		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	300	150	RCE-110	E48A10		UPE30015		FP119	TVL-1434	
C2	125	350	RCE-140	E48A148		UPE12535		FP140	TVL-1638	
C3	150	300	RCE-143	E48A11		UPE12535		FP229-3	TVL-1638	
C4	30	450	RCE-141	PRS450/30		BR3045A		TC77	TVA-1711	
C5A	▲100	75	RCE-142	AFH2-93		UPT307		FP255	TVL-1714	
B	■20	300							TVA-1420	
C6A	▲10	450	RCE-118	AFH3-154		UPT306		FP396.2	TVL-2826	
B	■40	300								
C	▲10	150								
C7	1	50	RCE-090	PRS150/4		BBR-1-50T		TC31	TVA-1300	
C8	1	50	RCE-090	PRS150/4		BBR-1-50T		TC31	TVA-1300	
C9	1				TCZ-1		NP0K-010			
C10	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C11	680		RCW-3045	SI680	D6-681		GP2K-681	UC-5368	5GA-T68	
C12	5		RCW-3057	SI5NP0	TCZ-4.7		NP0K-050	ZT555	5TCCB-V47	
C13	5	500	UCG-1005	1469-000005		5R5V5		MCB205	MS-55	
C14	10		RCW-3066	SI10NP0	TCZ-10		NP0K-100	ZT541	5TCC-Q1	
C15	10		RCW-3066	SI10NP0	TCZ-10		NP0K-100	ZT541	5TCC-Q1	
C16	1-5		RCY-065		829-6					
C17A	800		RCN-027	BPD-2X001	DD-2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	800									
C18	15		RCW-3076		TCZ-15		NP0K-150		5TCC-Q15	
C19	1-5		RCY-065		829-6					
C20	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C21	.6-2.4		RCY-047		829-3			CT565A		
C22	680		RCW-3027	SI680	D6-681		GP2K-681	UC-5368	5GA-T68	
C23	680		RCW-3045	SI680	D6-681		GP2K-681	UC-5368	5GA-T68	
C24	3.9		RCN-055				NP0K-3R9			
C25	1.5		RCW-3046				N750K-1R5			
C26	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C27	12		RCW-3074		TCZ-12		NP0K-120			
C28	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C29	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C30	5	500	UCG-1005	1469-000005	TCZ-4.7	5R5V5	NP0K-050	MCB205	MS-55	
C31	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C32	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C33	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C34	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C35	.05	600	RCC-102	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C36	150	500	UCU-532	1468-00015	D6-151	5W5T15	GP2K-151	MC236	1FM-315	
C37	150	500	UCU-532	1468-00015	D6-151	5W5T15	GP2K-151	MC236	1FM-315	
C38	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C39	51	500	UCG-2021							
C40	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C41	.5	200	RCC-016	P288-5		PJ2P5			2TM-P5	
C42	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C43	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C44	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C45	5	500	UCG-1005	1468-000005	TCZ-4.7	5W5V5	GP1K-050	MC205	MS-35	
C46	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C47	10	500	UCG-2004	1468-00001	D6-100	5W5Q1	GP1K-100	MC215	1FM-45	
C48	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C49	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C50	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C51	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C52	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C53	.05	200	RCC-105	P288-05	DF-503	PJ2S5		PT415	2TM-S5	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	18	500	UCG-3010	SIIB	D6-180	SR5Q4	GP1K-180	UC5418	5GA-Q18	
C55	100	500	UCU-1538	1469-0001		5R5T1		MCB235	MB-31	
C56	.05	200	UCC-045	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C57	6	500	UCU-002	1469-000005		5R5V5		MCB205	MS-55	
C58	.1	600	RCN-031	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C59	.5	200	RCC-016	P288-5		PJ2P5		PT431	2TM-P5	
C60	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C61A	4000		RCN-047	BPD-2X004	D6-402	TM5DD4	822-004	DCD-524	5HK-2D4	
B	4000				D6-402					
C62	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C63	100	500	UCU-036	1468-0001	D6-101	5W5T1	GP1K-101		1FM-31	
C64	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C65	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C66	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C67	.001	600	UCC-035	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C68	.002	600	UCC-036	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C69	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C70	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C71	.003	600	UCC-037	P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C72A	.01									
B	250		♦REK-002		♦PC-81		♦1404-02		♦102C2	
C										
C73	.005	1000	RCC-059	P1088-005		PTE16D5		PT1625	MB-D5	
C74	.1	600	UCC-048	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C75	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C76	.05	200	UCC-045	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C77	.2	200	UCC-050	P488-22		PTE4P22		TP429	2TM-P22	
C78	.01	600	RCN-018	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C79	470	500	UCU-1044	1469-0005	D6-471	5R5T5	GP2K-471	MCB245	MS-35	
C80A	.001		†REK-003	P688-001	†PC-176	PTE6D1	GP2L-102	PT621	6TM-D1	
B	.0022			P688-0022		PTE6D22	GP2-333-222	PT6222	6TM-D22	
C81	220	500	UCG-1036	1468-00025	D6-221	5W5T25	GP2K-221		1FM-325	Note 2
C82	.001	600	UCC-035	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	Note 1
C83	.0022	600	RCN-060	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C84	.06	800	RCC-112	684-06		PTE6S6		PT616	6TM-S6	
C85	470	500	UCU-1044	1469-0005	D6-471	5R5T5	GP2K-471	MCB245	MS-35	
C86	.02	600	RCC-113	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C87	.02	600	RCC-113	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C88	.022	1000	RCN-044	P1088-022		PTE16S2		PT1612	MB-S22	
C89	.003	600	RCC-111	P688-003	D6-302	PTE6D3	GP2- 333-302	PT623	6TM-D3	
C90	.001	1000	RCN-061	P1088-001		PTE16D1		PT1621	MB-D1	
C91	130	800	RCU-299							
C92	200	500	UCU-028	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C93	.03	400	UCC-042	P688-03		PTE6S3		PT613	6TM-S3	
C94	680	500	RCU-294	81680	D6-681	5R5T7	GP2K-681	UC-5368	MS-37	
C95	.01	600	RCN-025	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C96	.05	600	RCC-102	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C97	.0039	600	RCN-034	P688-004	D6-402	PTE6D4	GP2-333-402	PT624	6TM-D4	
C98	.05	200	RCC-105	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C99	470	500	UCU-1044	1468-0005	D6-471	5W5T5	GP2K-471	MC245	1FM-35	
C100	.0018	600	RCN-033					PT613	6TM-S3	
C101	220	500	UCG-1039	1469-00025	D6-221	5R5T25	GP2K-221	MCB240	MS-325	
C102	1000	500	RCN-062	1464-001	D6-102	1R5D1	GP2L-102	MCB255	1FM-21	
C103	.0018	600	RCN-033							
C104	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C105	6	1500	RCU-300							
C106	22	500	UCG-1012	1469-000025		5R5Q25		MCB220	MS-425	
C107	.1	600	UCC-048	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C108	47	500	UCG-1020	1469-00005	D6-470	5R5Q5	GP1K-470	MCB225	MS-45	
C109	220	500	UCU-036	1469-00025	D6-221	5R5T25	GP2K-221	MCB240	MS-32	
C110	.5	200	RCC-016	P288-5		PJ2P5		TP431	2TM-P5	
C111	.1	600	UCC-048	P688-1		PTE6P1		PT601	6TM-P1	
C112	.08	600	RCC-114							
C113	12	1500	RCU-305							
C114	500	20000	RCN-035	HV20C	TV3-502	MMC-20TS	413-501		20DK-T5	
C115	.05	600	RCC-102	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C116	22	500		1468-000025		5R5Q25		MCB220	MS-425	

Note 1. Not used in all Models.
Note 2. Some Models use 1200MMF in this application. Early production has 100MMF.
♦ Items C72A, C72B, C72C, R67A, R67B are combined in one unit.
When replacing items separately C72B and C72C should total 250MMF.
† Items C80A, C80B, R80A, R80B are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA General Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2 Meg	½	RRC-186	QJ-328 *				Contrast-Panel
B	500KΩ	½						Volume & SW -Rear
R2A	500KΩ	½	RRC-175	QII-113	AG-58-S	AB-59	U-50	Brightne ss
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Not Req.	Attach to R2A
R3A	125KΩ	½	RRC-174	QII-228	AG-49-S		U-415	Vert. Hold
B	Shaft		Not Req.	Not Req.	RS-2		Not Req.	Attach to R3A
R4A	100KΩ	½	RRC-173	QII-128	AG-49-S	AB-40	U-41	Horiz. Hold
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Not Req.	Attach to R4A
R5A	25KΩ	½	RRC-140	QII-120	AG-40-S	AB-26	5U-29	Horiz. Drive-Note 1
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	3 Meg	½	RRC-096	QII-140	AG-85-S	AB-84	5U-59	Picture-Stability -Note 2
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	3 Meg	½	RRC-096	QII-140	AG-85-S	AB-84	5U-59	Height
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach oto R7A
R8A	4000Ω	2	RRC-127	W-4000	A43-4000	VK-134	R5000L	Vert. Linearity-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8 A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B11-139 & P1-204 (Panel)
B13-133 & R2-230 (Rear) & SWITCH 76-1.
Note 1 Some models use alternate control (5000Ω Part No. RRC-195).
Note 2 Some models use alternate control (3 Meg Part No. RRC-196).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Gen. Elect. PART No.	IRC PART No.	NOTES
R9	3.3Meg	½	URD-133	BTS-3.3Meg	
R10	3.3Meg	½	URD-133	BTS-3.3Meg	
R11	120Ω	½	URD-027	BTS-120	
R12	18KΩ	½	URD-079	BTS-18K	
R13	18KΩ	½	URD-079		
R14	5600Ω	½	URD-067		
R15	680Ω	½	URD-045	BTS-680	
R16	1200Ω	½	URD-051	BTS-1200	
R17	10KΩ	½	URD-073	BTS-10K	
R18	12KΩ	½	URD-075		
R19	1000Ω	½	URD-049	BTS-1000	
R20	5600Ω	½	URD-067		
R21	10KΩ	½	URD-073	BTS-10K	
R22	220KΩ	½	URD-105	BTS-220K	
R23	1000Ω	½	URD-049	BTS-1000	
R24	1000Ω	½	URD-049	BTS-1000	
R25	8200Ω	½	URD-071	BTS-8200	
R26	3300Ω	½	URD-061	BTS-3300	
R27	2200Ω	½	URD-057	BTS-2200	
R28	5600Ω	5	RRW-079		
R29	22KΩ	½	URD-081		
R30	100Ω	½	URD-025	BTS-100	
R31	27KΩ	½	URD- -83		
R32	1000Ω	½	URD-049	BTS-1000	
R33	220KΩ	½	URD-105		
R34	100Ω	½	URD-025	BTS-100	
R35	1000Ω	½	URD-049	BTS-1000	
R36	22KΩ-5%	½	URD-1081		
R37	82Ω	½	URD-023	BTS-82	
R38	820Ω-5%	1		BTA-820-5%	Note 1
R39	5600Ω	2	URF-067	BTB-5600	
R40	2200Ω	2		BTB-2200	Note 2
R41	1200Ω	2		BTB-1200	Note 3
R42	3300Ω-5%	1	URD-1081	BTS-3300-5%	Note 4
R43	33KΩ	½	URD-085	BTS-33K	Note 5
R44	33KΩ	½	URD-085	BTS-33K	
R45	2.2Meg	½	URD-129	BTS-2.2Meg	
R46	1500Ω	½	URD-053	BTS-1500	
R47	18KΩ	2	URF-079	BTB-18K	
R48	4700Ω	2	URF-065	BTB-4700	
R49	22KΩ	½	URD-081	BTS-22K	
R50	220KΩ	½	URD-105	BTS-220K	
R51	47KΩ	½	URD-089	BTS-47K	
R52	150KΩ	½	URD-101	BTS-150K	
R53	100KΩ	½	URD-097	BTS-100K	
R54	1 Meg	½	URD-121	BTS-1 Meg	
R55	220Ω	½	URD-033	BTS-220	
R56	39KΩ	½	URD-087		
R57	10KΩ	½	URD-073		
R58	56KΩ	½	URD-091	BTS-56K	
R59	100KΩ-5%	½	URD-1097		
R60	470KΩ	½	URD-113		
R61	1000Ω	½	URD-049	BTS-1000	
R62	270Ω	½	URD-035	BTS-270	
R63	22KΩ-5%	½	URD-1081	BTS-22K-5%	
R64	22KΩ-5%	½	URD-1081	BTS-22K-5%	
R65	22KΩ-5%	½	URD-1081	BTS-22K-5%	
R66	4.7Meg	½	URD-137	BTS-4.7Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Gen. Electric PART No.	IRC PART No.	NOTES
R67A	250KΩ	½	♦REK-002		
B	500KΩ	½			
R68	1000Ω	½	URD-049	BTS-1000	
R69	150Ω	1	URE-029	BTA-150	
R70	47KΩ	½	URD-089	BTS-47K	
R71	470KΩ	½	URD-113	BTS-470K	
R72	1 Meg	½	URD-121	BTS-1 Meg	
R73	680KΩ	½	URD-117	BTS-680K	Note 6
R74	22KΩ	1	URE-081	BTA-22K	
R75	10KΩ	½	URD-073	BTS-10K	
R76	220Ω	½	URD-033	BTS-220	
R77	470KΩ	½	URD-113	BTS-47K	
R78	47KΩ	½	URD-089	BTS-47K	
R79	18KΩ	½	URD-079	BTS-18K	
R80A	82KΩ	½	†REK-003	BTS-82K	
B	39KΩ	½		BTS-39K	
R81	100KΩ-5%	½	URD-1097	BTS-100K-5%	
R82	47KΩ	1	URE-089	BTA-47K	
R83	100KΩ	1		BTA-100K	
R84	2.2Meg	½	URD-129	BTS-2.2Meg	
R85	3.3Meg	½	URD-133	BTS-3.3Meg	
R86	470Ω	1	URE-041	BTA-470	
R87	220Ω	½	URD-033	BTS-220	
R88	82KΩ	½	URD-095	BTS-82K	
R89	470Ω	1	URE-041	BTA-470	
R90	180KΩ	½	URD-103	BTS-180K	
R91	1 Meg	½	URD-121	BTS-1 Meg	
R92	1 Meg	½	URD-121	BTS-1 Meg	
R93	150KΩ	½	URD-101	BTS-150K	
R94	1 Meg	½	URD-121	BTS- 1 Meg	
R95	33KΩ	½	URD-085	BTS-33K	
R96	68KΩ	1	URE-093	BTA-68K	
R97	150KΩ	1	URE-101	BTA-150K	
R98	150KΩ	1	URE-101	BTA-150K	
R99	27KΩ	½	URD-083	BTS-27K	
R100	68KΩ	½	URD-093	BTS-68K	
R101	10KΩ	½	URD-073	BTS-10K	
R102	6800Ω	1		BTA-6800	Note 7
R103	56KΩ	2	URF-091	BTB-56K	
R104	1 Meg	½	URD-121	BTS-15K	
R105	15KΩ	½	URD-077	BTS-15K	
R106	330Ω	½	URD-037		
R107	‡	½	RRW-088		
R108	4000Ω	10	RRW-053	1 3/4A-4000	
R109	1200Ω	½	URD-051	BTS-1200	
R110	470KΩ	½	URD-113	BTS-470K	
R111	1000Ω	1	URE-049	BTA-1000	
R112	150KΩ	1	URE-101	BTA-150K	
R113	150KΩ	1	URE-101	BTA-150K	
R114	150KΩ	1	URE-101	BTA-150K	
R115	3300Ω	2	URF-081	BTB-3300	
R116	4.6Ω	10	RRW-048		
R117	1500Ω	10	RRW-082	1 3/4A-1500	
R118	*	*	RRW-051		
R119	180KΩ	½	URD-103	BTS-180K	
R120	1.2Ω	1	RRW-058		
R121	470KΩ	½	URE-113		
R122	22KΩ	½	URD-081	BTS-22K	
R123	47KΩ	½	URD-089	BTS-47K	
R124	100KΩ	½	URD-097	BTS-100K	

♦ Items R67A, R67B, C72A, C72B, C72C are combined in one unit.
† Items R80A, R80B, C80A, C80B are combined in one unit.
Note 1 Some models use a 1000Ω resistor in this application.
Note 2 Some models use a 3300Ω resistor in this application.
Note 3 Not used in early production models.
Note 4 Early production models use a 4300Ω resistor in this application.
Note 5 Early production models use a 47KΩ resistor in this application.
Note 6 Early production models use a 1.5Meg resistor in this applicatin.
Note 7 Not used in all models.
‡ Special resistor which measures 14KΩ at 140 volts.
* Resistance varies with temperature (20Ω Hot, 250Ω Cold)

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Gen. Electric PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC	6.3VAC			RTF-002	P-8190 ①	P-2944 ①	FO-615	F-52X ①
	② .07A	.6A							

① Drill one new mtg. hole.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA Gen. Electric PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	443Ω Tap ② 43Ω	240 Tap ② 13Ω, 19Ω SEC #3 0Ω	RTO-116	HVO-7	A-8130	TFB-5	D-14	Horiz. Output Trans.
T3	170Ω Tap ② 8Ω		RTO-117	A-3037	A-8123 ①	TSO-8 ①	A-120X	Vert. Output Trans
T4A	30Ω		RLD-041					Horiz. Deflection Coils
B	80Ω							Vert. Deflection Coils.

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA Gen. Elec. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T5	2.3KΩ	3.5KΩ	184Ω	.46Ω	RTO-081	A-3332	A-3025	RO-2 ①	S-1X ①	① Drill one new mtg. hole

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA Gen. Electric PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3.5Ω	K-69J178	ST-803 Mod. P525-V		

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ^)	REPLACEMENT DATA Gen. Electric PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.320A	28Ω	.91HY	RLF-051	C-2328 ①		TR-1733 ①	C-23X ①

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA General Electric PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	Ant. Trans.	.1Ω	.1Ω	RLA-037			
L3	Ant. Coil	0Ω		RLI-165			
L4	Ant. Coil	0Ω					
L5	RF Choke	0Ω					
L6	IF Trap	0Ω		RLI-159			
L7	Fil. Choke	.3Ω		RLI-144		CLA	.56 Microhenry
L8	1st.RF Plate Coils	0Ω					
L9	RF Coil	0Ω					
L10	2nd.RF Grid Coils	0Ω					
L11	2nd.RF Plate Coils	0Ω					
L12	Osc. Coils	0Ω					
L13	Cathode Choke	.1Ω		RLI-145			1.4 Microhenries
L14	RF Choke	13.4Ω		RLI-152			
L15	RF Choke	3Ω		RLI-154		CLA	3.3 Microhenries
L16	Conv.Plate	.1Ω	.1Ω	RTL-139			
L17	RF Choke	3Ω		RLI-154		CLA	3.3 Microhenries
L18	1st.Video IF	.1Ω	.1Ω	RTL-137			Includes Trap
L19	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L20	2nd.Video IF	.1Ω		RLI-096			
L21	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L22	3rd.Video IF	.1Ω		RLI-173			
L23	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L24	Shunt Peaking Coil	5.5Ω		RLI-162	TV-184		165 Microhenries
L25	RF Choke	8.2Ω		RLI-138		CL-1	10 Microhenries
L26	Series Peaking Coil	4Ω		RLI-174	TV-181 *		80 Microhenries, wound on 3.3K resistor
L27	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L28	4.5MC Trap	.3Ω		RLI-100	TV-151		
L29	Shunt Peaking Coil	4.5Ω		RLI-108	TV-181		110 Microhenries
L30	Series Peaking Coil	6.6Ω		RLI-161	TV-184 †		165 Microhenries, wound on 6.8K resistor
L31	Shunt Peaking Coil	5.7Ω		RLI-162	TV-184		165 Microhenries
L32	Series Peaking Coil	5.2Ω		RLI-109			130 Microhenries
L33	Sound IF	3.3Ω	3.3Ω	RLI-097	TV-108		
L34	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L35	Ratio Det.	3.6Ω	.6Ω CT	RTD-088	TV-110		Tertiary Winding -.1Ω
L36	RF Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L37	RF Choke	8.2Ω		RLI-138		CL-1	10 Microhenries
L38	Horiz. Osc.	125Ω		RLC-091			Tapped ② 70Ω
L39	Horiz. Lin.	15Ω		RLD-016	MWC-1		
L40	Width Coil	27Ω		RLD-014	MWC-1		
L41	Plate Choke	8.2Ω		RLI-138		CL-1	10 Microhenries

* Parallel with 3.3KΩ resistor
† Parallel with 6.8KΩ resistor

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA Gen. Electric PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	NOTES
M1	.320ADC	RER-008	NJ5	6S2	1056	6S350	
M2	.320ADC	RER-008	NJ5	6S2	1056	6S350	

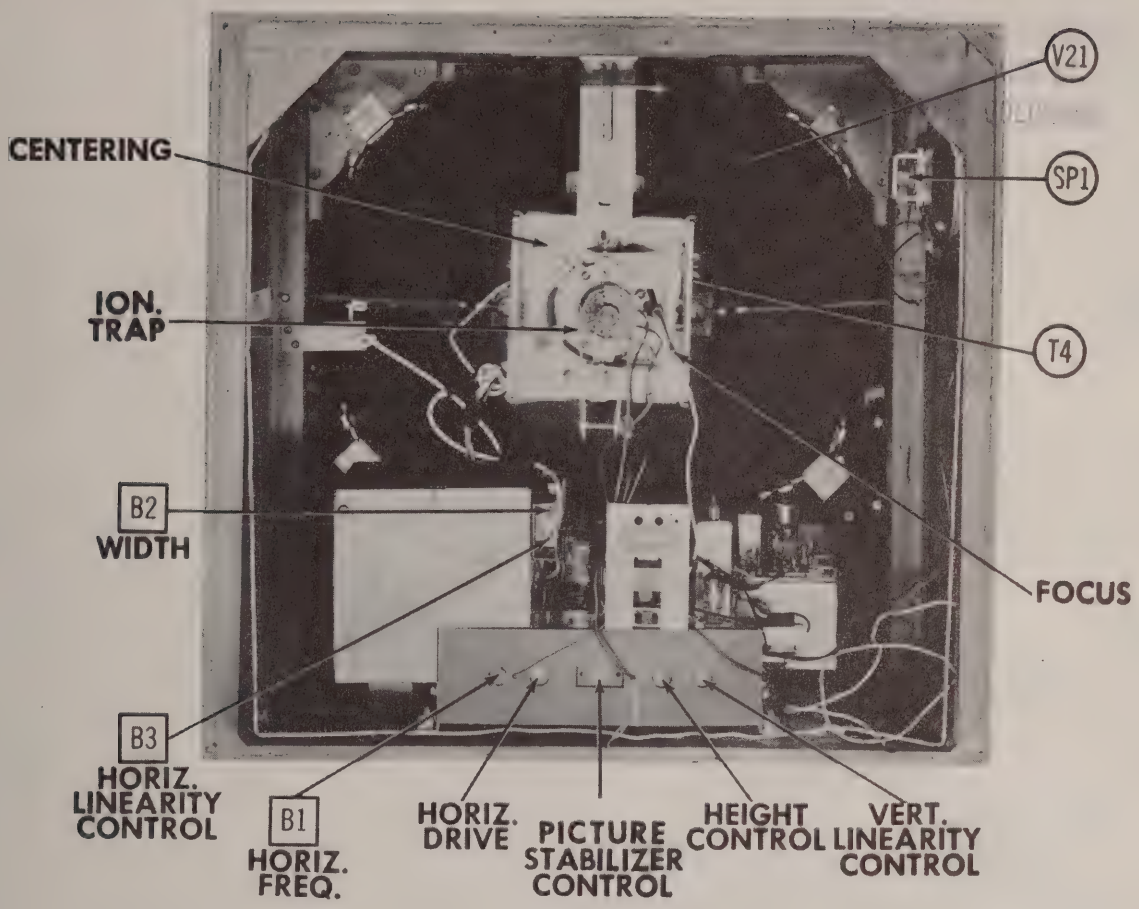
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Gen. Electric PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	MDV	1 1/4A 125V	REF-005		3151.25 (3AG-Slo-Blo-P/T)		MDV-1 1/4	

MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M4	RF Tuner	RJX-050	Complete with tubes
M5	4th. Video IF Amp.		Video Det. Assy. Part #RLX-035
	Capacitor	RCN-029	9MMF
	Crystal		1N60
	Capacitor	UCG-1005	5MMF
	RF Choke	RLF-024	31 Microhenries
	RF Choke	RLF-024	31 Microhenries
M6	Focus Magnet	RLF-054	
M7	Ion Trap	RET-013	
	Switch Wafer	RSX-023	Ant. (Complete with coils)
	Switch Wafer	RSX-022	1st. RF Plate (Complete with coils)
	Switch Wafer	RSX-021	2nd. RF Grid (Complete with coils)
	Switch Wafer	RSX-020	2nd. RF Plate (Complete with coils)
	Switch Wafer	RSX-019	Osc. (Complete with coils)
	Knob	RDK-244	Horiz. & Vert. Hold, Brightness (3 Used)
	Knob	RDK-263	Off/On Volume
	Knob	RDK-264	Channel Selector
	Knob	RDK-281	Fine Tuning
	Knob	RDK-282	Contrast
	Knob	RDK-291	Stabilizer Control
	Compression Ring	RMS-272	For Fine Tuning Knob
	Compression Ring	RMS-273	For Contrast Knob
	Mask	RDE-137	
	Safety Glass	RDW-057	
	Back Cover	RAB-189	Less Cap
	Cap (Back Cover)	RAC-115	
	Door	RAD-084	Control Knob Escutcheon Door (less Springs & Clips)
	Escutcheon	RDE-125	Control Door (Less springs & Clips)
	Cabinet	RAV-195	Mahogany (less mask & safety glass) Model 21T4
	Cabinet	RAV-196	Blonde (less mask & Safety glass) Model 21T5



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the front panel horizontal hold to the center of its range.

Adjust the horizontal oscillator slug, (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive control to maximum counter clockwise position without the presence of a vertical white line or compression of the center of the picture.

Adjust the width slug, (B2) for a slightly wider picture than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug, (B3) for a picture that is symmetrical from left to right.

PICTURE STABILIZER ADJUSTMENT

Adjust the picture stabilizer control for minimum noise interference and picture distortion.

If control is turned too far picture may be displaced downward and to the right.

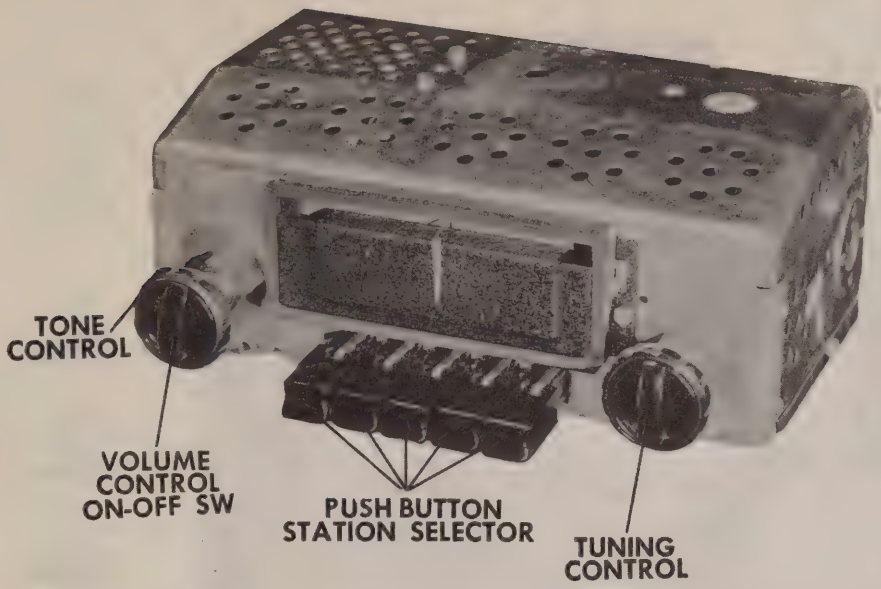
DISASSEMBLY INSTRUCTIONS

1. Remove 7 push-on type control knobs from front panel.
2. Remove 10 wood & 1 metal screws. Remove rear cover.
3. Disconnect speaker, focus & deflection plugs, CRT socket & HV lead plug.
4. Remove 4 speaker nuts. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

OF
NSHIP
ST.
NADO

NASH
MODEL AC-152 (NH2AC)



TRADE NAME	Nash Model AC-152 (Motorola Model NH2AC) (For 1952 Nash Automobile)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output , 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 5.8 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1605 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2) Low side to chassis	455 KC (400% Mod)	Extreme high frequency end.	Across voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle	1605 KC	"	"	A5	"
3.	"	"	1300 KC	Tune to 1300 KC	"	A6, A7	"
	If tuner coils or cores are replaced or tuner does not cover required range adjust as follows: (Remove pointer assembly and dial background gasket assembly.)						
4.	Fig. 1	Thru dummy to antenna receptacle	1605 KC	Extreme high frequency end of travel.	Across voice coil	A8, A9, A10, A5, A6, A7	Turn tuner cores A8, A9 and A10 out of coils until they have no effect on trimmer adjustments. Adjust for maximum output in order given.
5.	"	"	1300 KC	With tuning knob move carriage in 5/16" from position in step 4	"	A8, A9, A10	Adjust for maximum output in order given.
6	"	"	1605KC	Extreme high frequency end.	"	A5, A6 A7	Repeat 5 and 6 until no further change is noted.
	With receiver aligned and installed in car, tune to weak signal near 1400 KC and adjust A7 for maximum volume.						

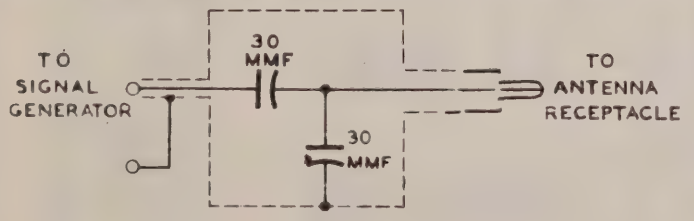


FIG. 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■15	350	23A485677	AFH3-104		UP15S135C		FP328	TVL-3630	
B	▲10	350								
C	20	25								
C2	90		21A591682							
C3	.006	100	8A4529	P488-006		PTE6D6	GP2-333-602	PT626	6TM-D6	
C4	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	.1	400	8R13166	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C6	5		21K70720	SI5	TCZ-4.7	5W5V5	GP1K-050	ZT-555	5GA-V5	
C7	47	500	21R6602	1469-00005	TCZ-47	5R5Q5	NP0K-470	MCB225	MS-45	
C8	220		21K580276				N150L-221			
C9	5		21K70720	SI5	TCZ-4.7	5W5V5	GP1K-050	ZT-555	5GA-V5	
C10	.01	200	8R472754	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C11	.006	400	8K71910	P488- 006		PTE6D6	GP2-333-602	PT626	6TM-D6	
C12	.02	100	8R51209	P488-02	DF-203	PJ2S2		PT412	2TM-S2	
C13	.01	400	8R23690	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C14	470		21R6531	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C15	.004	400	8K71909	P688-004	D6-470	PTE6D4	GP2-333-402	PT624	6TM-D4	
C16	.02	1000	8K114137	P1088-02		PTE16S2		PT1612	MB-S2	
C17	.5	100	8K17028	P185-5		MP2P5			68P20	
C18	.5	100	8K17028	P185-5		MP2P5			68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	250KΩ	½	18B512285	*			UF254-T753	Volume - Tapped @ 70KΩ-Panel
B	1Meg	½					UR16L	Tone - Rear
C	Switch						US-26	Attach to R1B

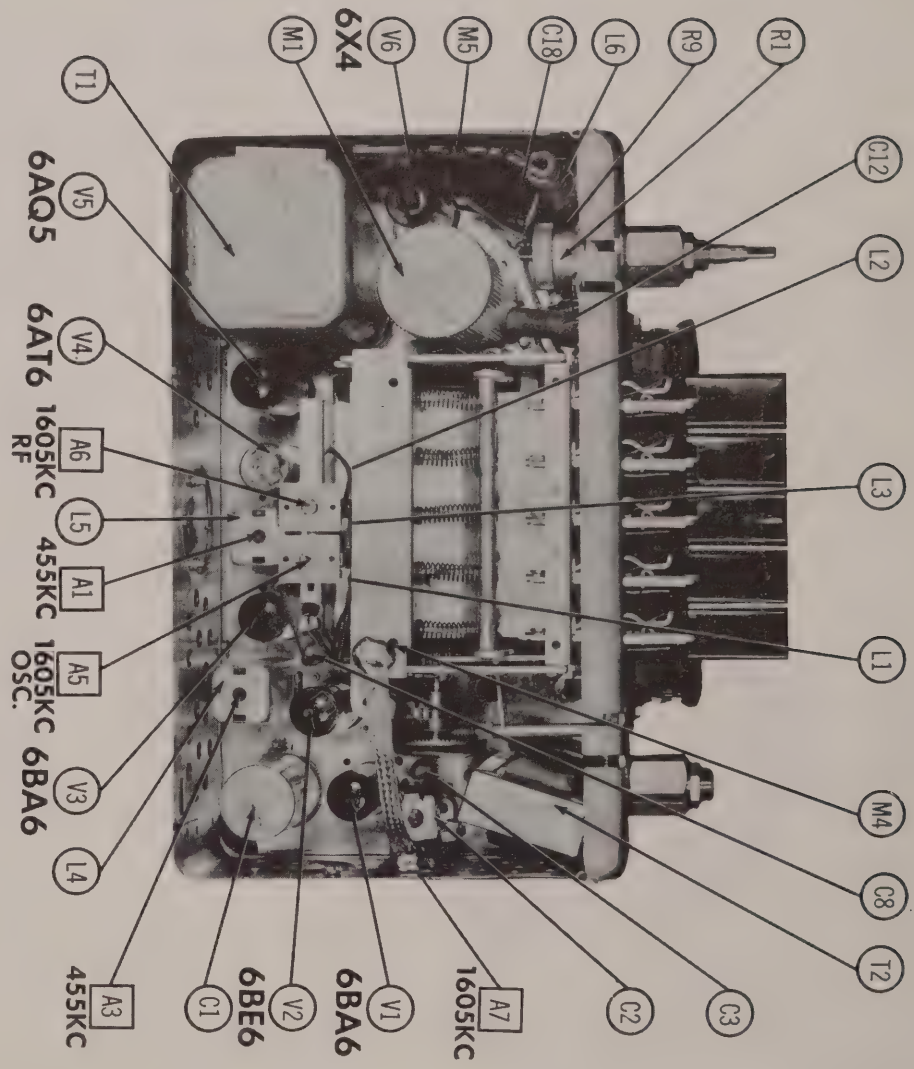
* CONCENTRIKIT EQUIVALENT KIT K-2, BASE ELEMENTS & SHAFTS B18-130X & P1-121 (Panel) B11-137 & R1-202 (Rear) & Switch 76-1.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	½	6R6032	BTS-470K	
R3	150Ω	½	6R3992	BTS-150	
R4	100KΩ	½	6R6075	BTS-100K	
R5	33KΩ	½	6R6012	BTS-33K	
R6	3900Ω	2	6R476012	BTB-3900	
R7	270Ω	½	6R6432	BTS-270	
R8	47KΩ	½	6R6056	BTS-47K	
R9	12KΩ	½	6R6394	BTS-12K	
R10	1Meg	½	6R6004	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PART No.	IRC PART No.	
R11	1Meg	½	6R6004	BTS-1Meg	
R12	4.7Meg	½	6R2122	BTS-4.7Meg	
R13	2700Ω	½	6R5577	BTS-2700	
R14	470KΩ	½	6R6032	BTS-470K	
R15	220KΩ	½	6R6015	BTS-220K	
R16	270Ω	½	6R6336	BTS-270	
R17	2200Ω	2	6R476130	BTB-2200	
R18	56Ω	½	6R5614		
R19	56Ω	½	6R5614		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VDC 5.8ADC	520VCT .055ADC			25B472533	P-6471	P-4071	VT-3	V-12K

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5.6KΩ	4.7Ω	500Ω	.7Ω	25B500727	A-3877	A-2930	RO-302	S-6X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5x7"	EM	4.7Ω	50C512500		57EV6SZ5	
SP2	5x7"	EM	4.7Ω	50C512500		57EV6SZ5	

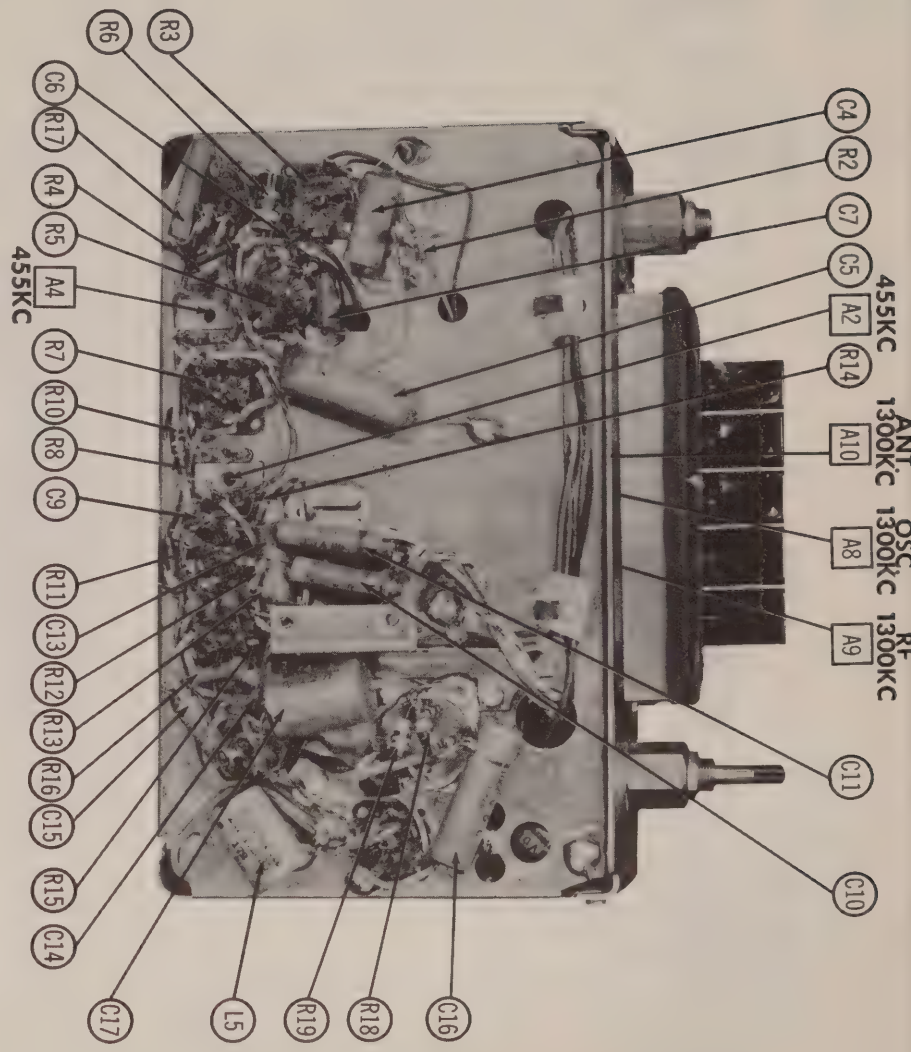
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MERIT PART No.	
L1	Ant. Coil	12.5Ω		24B580570		
L2	RF Coil	13Ω		24K580571		
L3	Osc. Coil	.8Ω	4.2Ω	24B501459		
L4	Input IF	18.5Ω	18.5Ω	24C485553	BC-352	
L5	Output IF	18Ω	18Ω	24K485555	BC-355	
L6	Line Choke	0Ω		24K592269		
L7	Hash Choke	0Ω		24A472535		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3	115v	48B3333	5342	859	5342	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	9K512927 *		307014	157020	SFE-14	HDI

* Includes fuse and fuse holder

DIAL LIGHTS

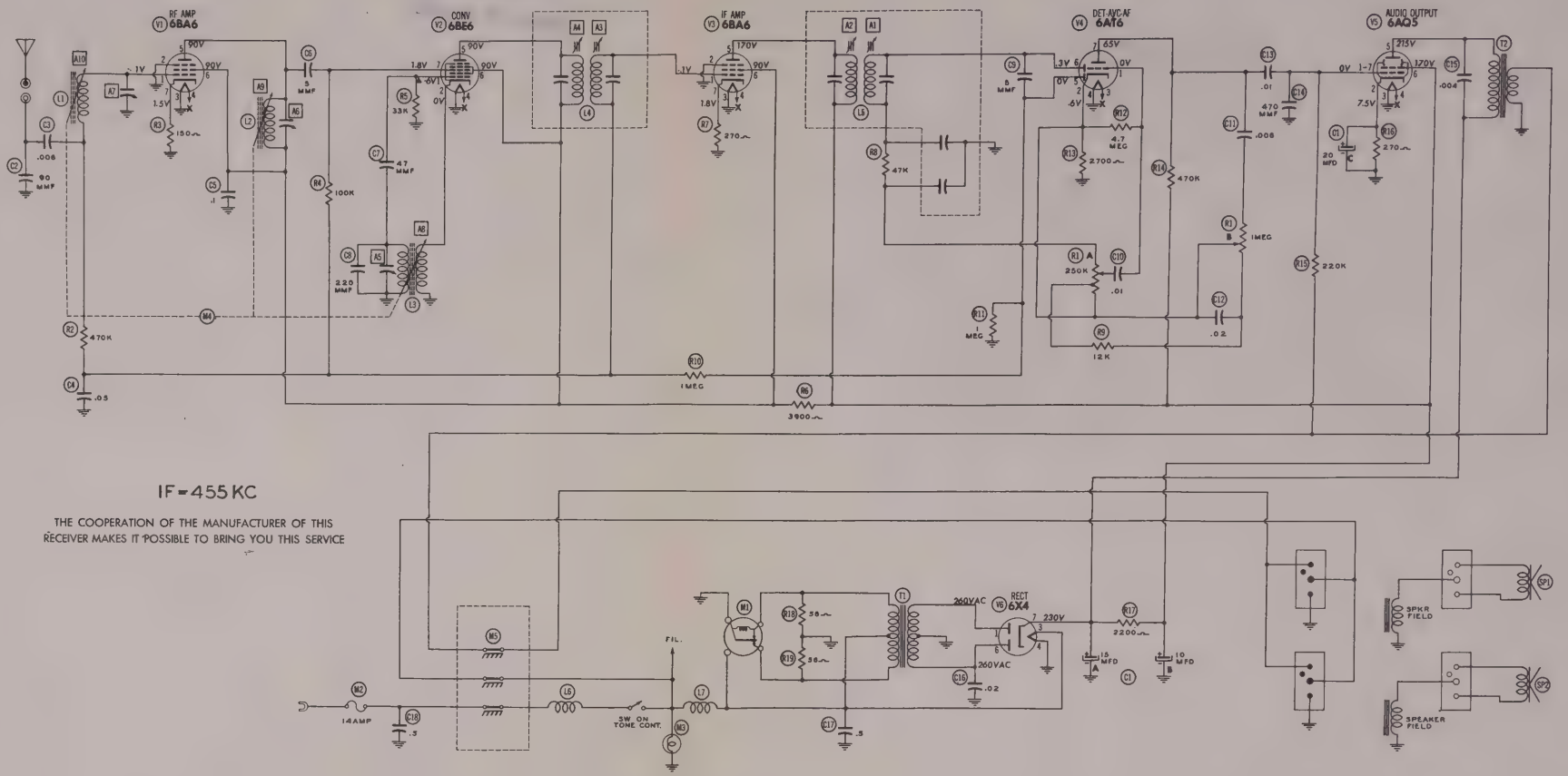
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M3	Bayonet	6-8	.25	Blue	65X10867		Type #44

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuner Unit	51D512340	
M5	Spark Plate	1A512328	
	Pointer	1X512381	Assembly with tip
	Knob	36B500638	Tone-on/off
	Knob	36A500657	Tuning
	Knob	1X503006	Volume

PUSH BUTTON ADJUSTMENT

1. Grasp push button by the sides with the fingers and pull outwards until button releases.
2. Tune manually to desired station.
3. Push button all the way in.
4. Repeat above procedure for remaining push buttons.



IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	2.5Meg	0Ω	0Ω	.4Ω	†6.1KΩ	†6.1KΩ	150Ω
V 2	6BE6	33KΩ	.8Ω	0Ω	.4Ω	†6.1KΩ	†6.1KΩ	2.1Meg
V 3	6BA6	2Meg	0Ω	0Ω	.4Ω	†2.2KΩ	†6.1KΩ	270Ω
V 4	6AT6	4.7Meg	2.7KΩ	.4Ω	0Ω	1Meg	300KΩ	†470K
V 5	6AQ5	220KΩ	270Ω	0Ω	.4Ω	†500Ω	†2.2KΩ	220KΩ
V 6	6X4	350Ω	INF	.4Ω	0Ω	INF	330Ω	95KΩ

1-DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2-Socket connections are shown as bottom views.
3-Measured values are from socket pin to common negative.
4-Battery voltage maintained at 6.3 volts for voltage readings.
5-Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6-Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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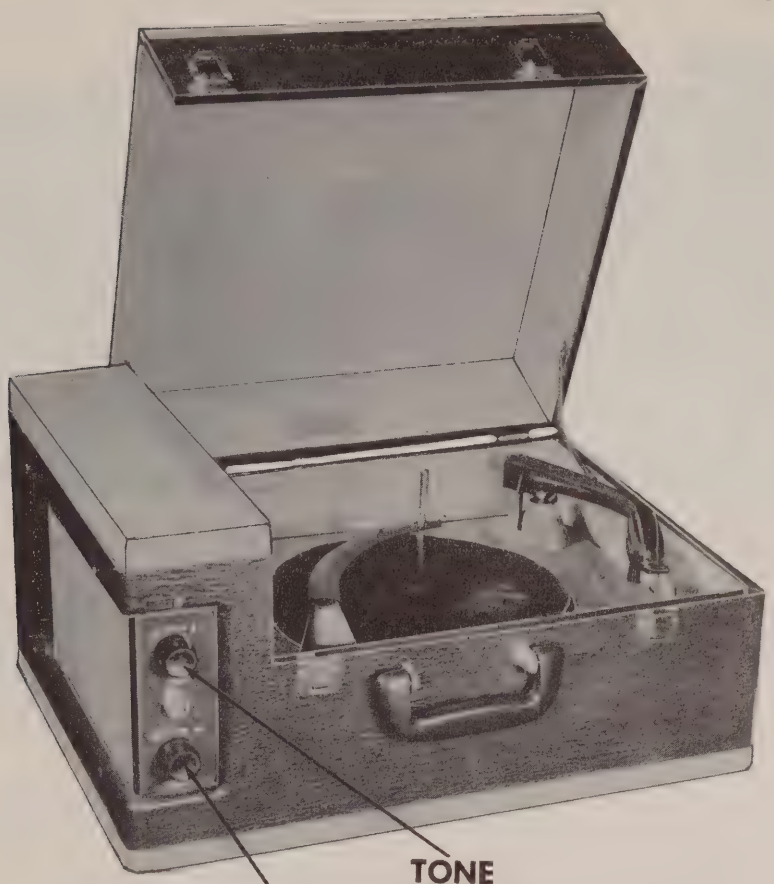
† MEASURED FROM PIN 7 OF V6.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

PENTRON MODEL F-100

PROPERTY OF
L. F. BLANKENSHIP

PENTRON MODEL F-100



PENTRON MODEL F-100

TRADE NAME	Pentron Model F-100
MANUFACTURER	Pentron Corp., 211 E. Cullerton St., Chicago 16, Ill.
TYPE SET	AC Operated Audio Amplifier With 3 Speed Automatic Record Changer
TUBES (FOUR)	Types 12AX7 AF Amp.-Phase Inv., (2) 35C5 Audio Amp., 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .32 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE V-M MODEL 950 PHOTOFACT SET 107 - FOLDER 13 OR RECORD CHANGER MANUAL CM-3.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PENTRON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	AF Amp.-Phase Inv.	12AX7	12AX7	9A	
V2	Audio Output	35C5	35C5	7CV	
V3	Audio Output	35C5	35C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/40-20-20		E242215C		TN129	TVA-3448	
B	20	150		PRS25/25				TC26	TVA-1205	
C	20	150								
D	20	25								
C2	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C3	.003	400		P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C4	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C5	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C6	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C7	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C8	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PENTRON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	126A50413-4	Q13-133	AG-60-Z	B-60-S	U-48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch			76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	1 Meg	½		Q13-137	AG-63-Z	BSK-70	U-53	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

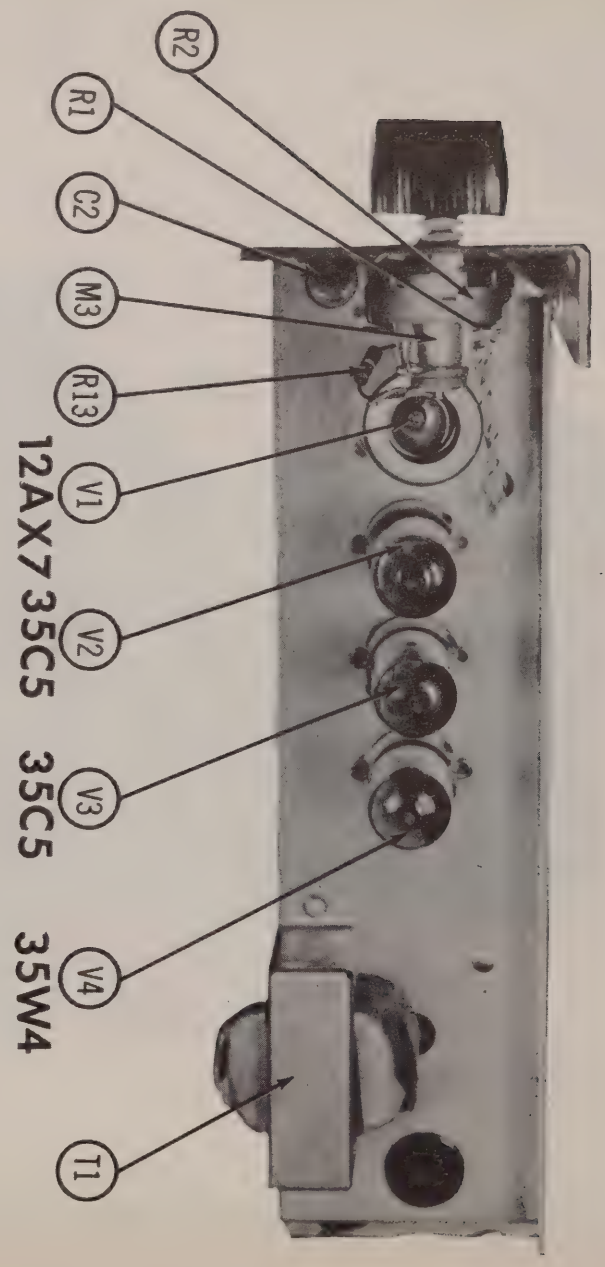
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PENTRON PART No.	IRC PART No.	NOTES
R3	4.7Meg	½		BTS-4.7Meg	
R4	270KΩ	½		BTS-270K	
R5	4.7Meg	½		BTS-4.7Meg	
R6	100KΩ	½		BTS-100K	
R7	100KΩ	½		BTS-100K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PENTRON PART No.	IRC PART No.	NOTES
R8	470KΩ	½		BTS-470K	
R9	100Ω	½		BTS-100	
R10	470KΩ	½		BTS-470K	
R11	22KΩ	½		BTS-22K	
R12	1500Ω	1		BTA-1500	
R13	100KΩ	½		BTS-100K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: PENTRON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	3.9KΩ	3.3Ω	325Ω	.32Ω	342A13	A-3823	A-3018	RO-303	S-4X ①	① Drill one new mtg. hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PENTRON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"	PM		345-11	ST-103 Mod. P6-X	6A1	

PHONO CARTRIDGE

ITEM No.	PENTRON PART No.	REPLACEMENT DATA						REMARKS
		ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A1 A3	W22AB	A62A A65MG	96T	0-1 or S-1 and 0-3 or S-3	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

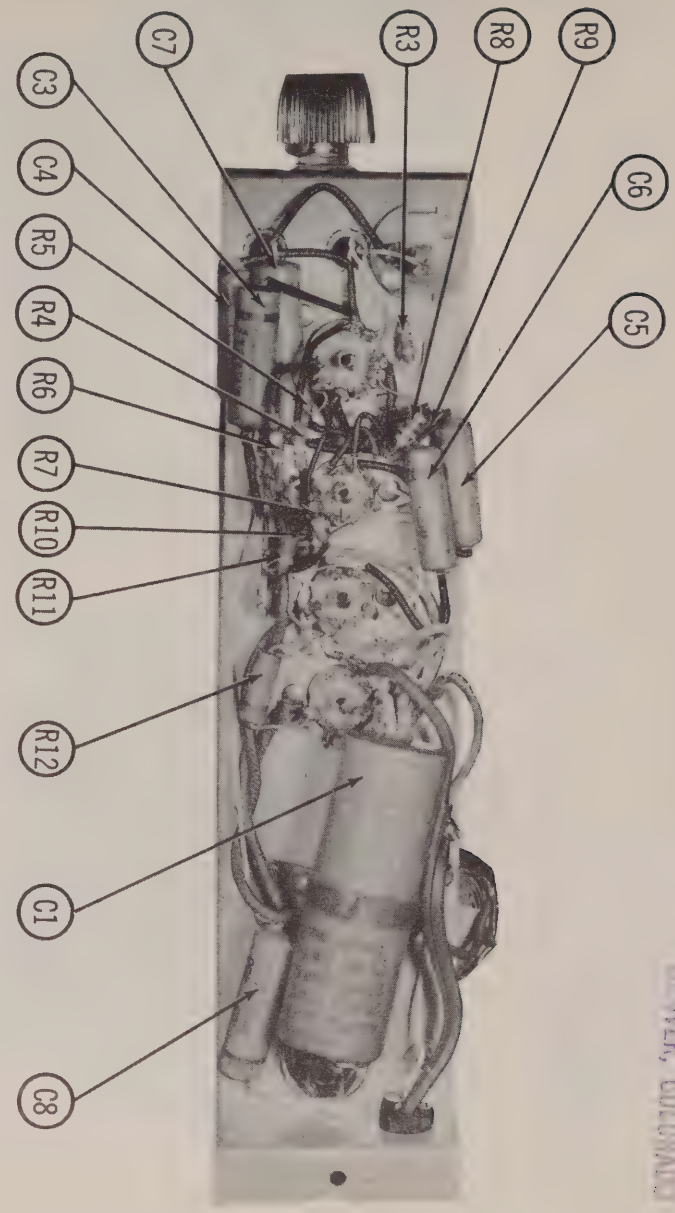
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PENTRON PART No.	WALCO PART No.	JENSEN PART No.	
M2		W-30A and W-30MGS	JP-30 and JPS-30LP	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PENTRON PART No.		
M3	Bayonet						Neon Type #NE51

CHASSIS—BOTTOM VIEW



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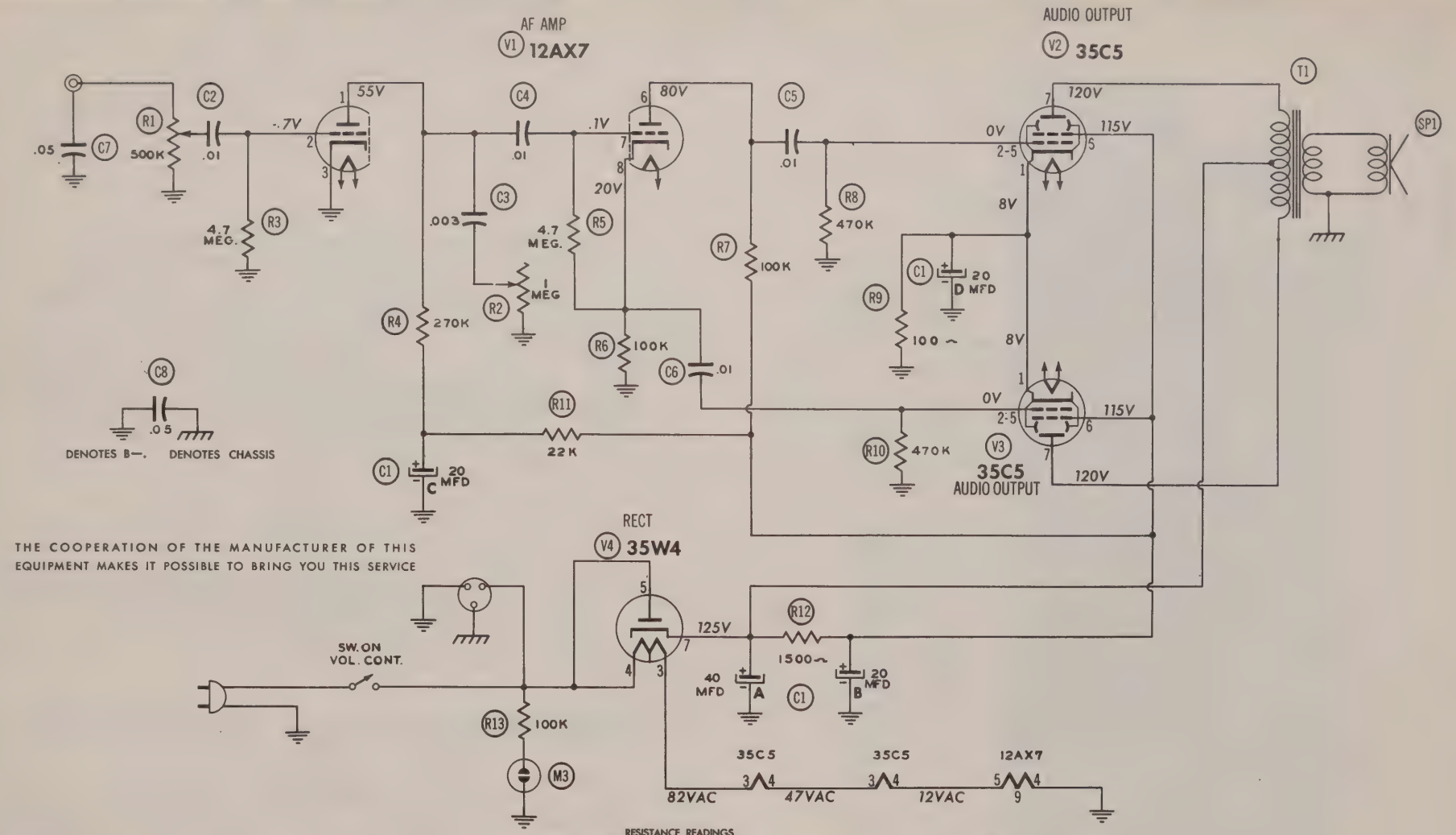

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†295KΩ	4.7Meg	0Ω	0Ω	12Ω	†123KΩ	4.8Meg	100KΩ	6Ω
V 2	35C5	100Ω	470KΩ	47Ω	12Ω	470KΩ	†1.5KΩ	†160Ω		
V 3	35C5	100Ω	470KΩ	82Ω	47Ω	470KΩ	†1.5KΩ	†160Ω		
V 4	35W4	INF	INF	82Ω	117Ω	117Ω	100Ω	35KΩ		

† MEASURED FROM PIN 7 OF V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1-DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2-Socket connections are shown as bottom views.
3-Measured values are from socket pin to common negative.
4-Line voltage maintained at 117 volts for voltage readings.
5-Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6-All controls at minimum, proper output load connected.

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PENTRON
MODELS PB-A2, PB-1

Figure 1A, Model PB-A2.

Figure 1B, Model PB-1.

PENTRON
MODELS PB-A2, PB-1

GENERAL INFORMATION

The Pentron PB-A2 and PB-1 Tape Players are designed to play a standard 5-inch or 7-inch reel of 1/4-inch wide tape, two tracks instead of one, which doubles the playing time. Recordings made at 3.75 inches per second or 7.5 inches per second can be played on these units.

The PB-1 and PB-A2 are similar mechanically, the only differences being that no speaker or power amplifier is provided with the PB-1. The PB-1 is intended for use with an external amplifier, public address system, or any radio or television receiver having a phono input.

Connect these units only to an outlet supplying 110 volt, 60 cycle, AC. current.

Manufactured by:

The Pentron Corporation
221 East Cullerton Avenue
Chicago 16, Illinois

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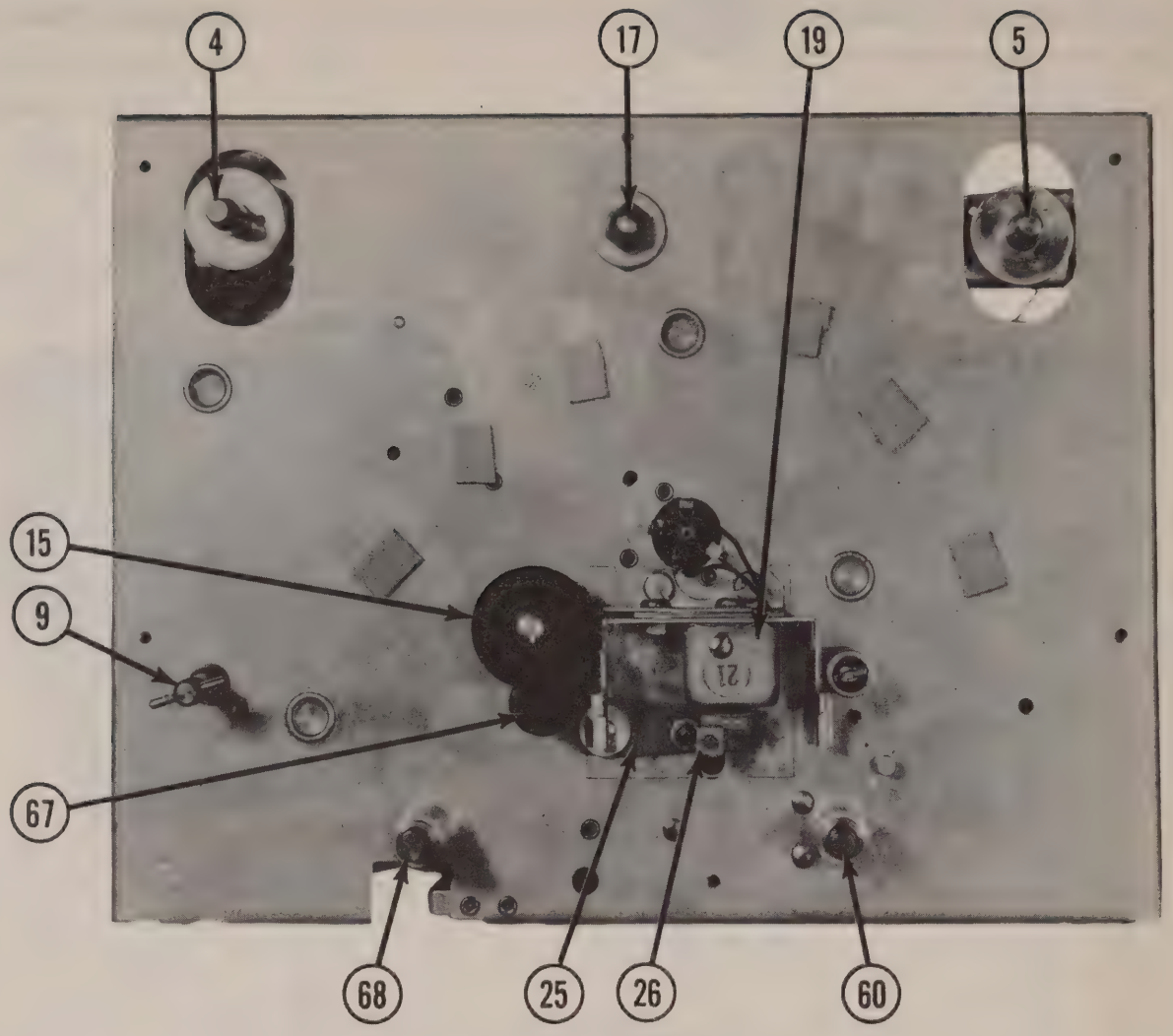

Figure 2.

Playing Time -

2 hours on 7" reel at 3-3/4" per second.
1 hour on 5" reel at 3-3/4" per second.
1 hour on 7" reel at 7-1/2" per second.
1/2 hour on 5" reel at 7-1/2" per second.

Fast Forward and Rewind -

20 to 1, or 70 seconds for 1200 feet.

OPERATING INSTRUCTIONS
Model PB-A2 and PB-1

1. Remove the lid from the carrying case.

2. Place a reel of tape on the right hand spindle (Feed Reel), so that the tape is pulled from the reel in a clockwise direction.

Note: These Pentron Tape Players use Type "A" wound tape i.e. the dull magnetic coated side faces the center of the reel. If the recording tape to be played is Type "B" (coated side facing outward), place the full reel on the left hand spindle (Take-Up Reel) so the tape will unwind in a counterclockwise direction. Place an empty reel on the right hand spindle. Thread the tape through the playback slot, and on to the empty reel in a manner so the dull side of the tape faces inward. The tape will then wind on the empty reel in a half twist. Turn the "Wind-Neutral -Rewind" knob to "Rewind" and allow the entire reel of tape to wind on the right hand reel.

3. Place an empty reel on the left hand spindle (Take-Up Reel Spindle). Be sure that both reels are engaged with the drive pins on the spindle.

4. Pull about two feet of tape from the supply reel and insert the loose end of the tape into one of the slots in the take-up reel. Use a lead pencil to hold the tape in place and rotate the reel clockwise until the tape is secured to the reel.

5. Now drop the tape into the playback slot. Make sure the dull magnetic side of the tape is facing the playback head and that the tape is not in a twist.

6. Rotate the take-up reel clockwise until all slack in the tape is taken up.

7. Set the speed change pin (9) so the player will run at the speed desired, 3-3/4" per second, or 7-1/2" per second.

Note: For 3-3/4" per second operation, turn

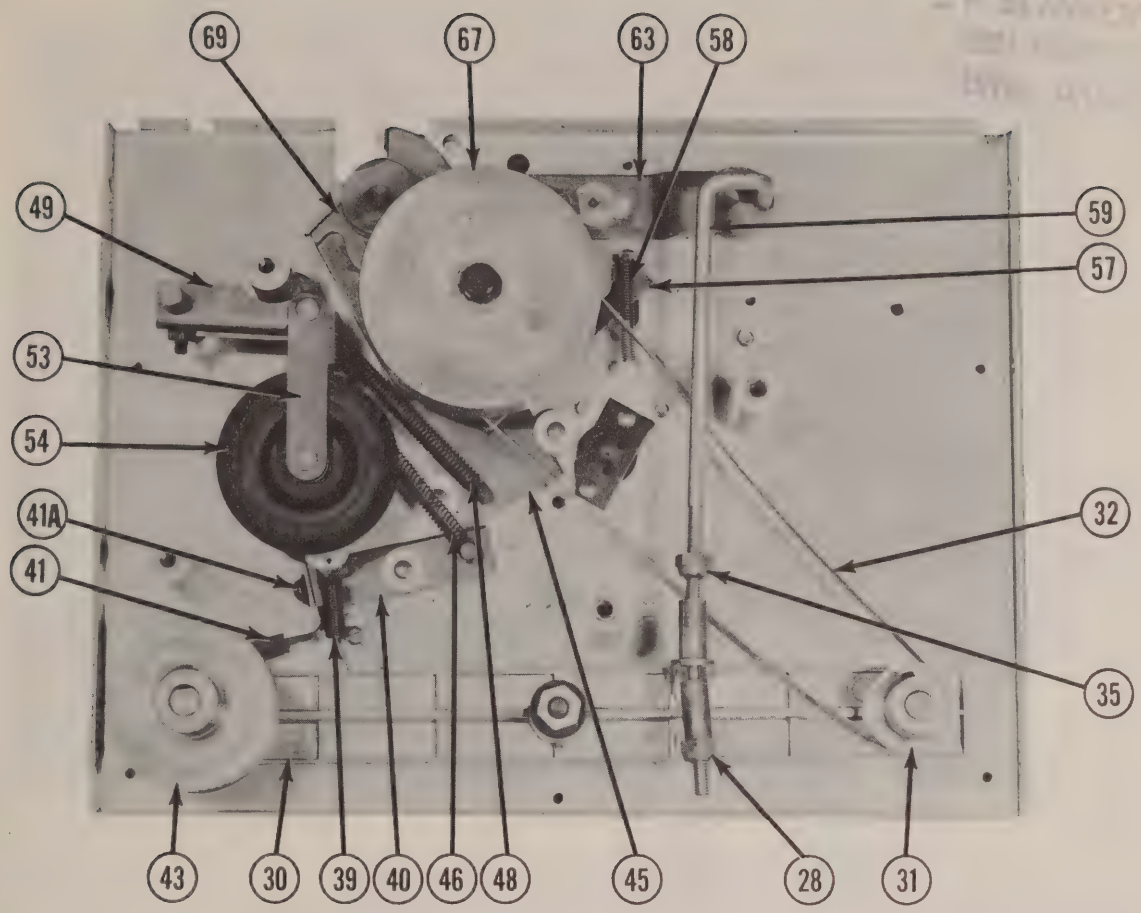

Figure 3.

the speed change pin (9) clockwise and pull it up, then release. This engages the idler wheel (54) with the small O.D. on the motor pulley (70). For 7-1/2" per second operation, turn pin (9) in a clockwise direction and push it down, then release. The idler wheel will then engage a larger O.D. of the motor pulley.

To Play a Recording on the PB-A2 -

1. With the tape properly threaded turn the "Tone" control switch on and wait about thirty seconds for the unit to warm up.

2. Turn the "Idle-Play" knob to "Play" position.

3. Adjust the "Volume" and "Tone" controls to suit.

To Play a Recording on the PB-1 -

1. The operation is the same as for the PB-A2 except that no volume or tone controls are provided.

2. Plug the shielded output cord of the player into the phono input of the amplifier or receiver being used.

3. Use the volume and tone controls on the amplifier or receiver.

4. A toggle switch is provided for turning the power to the PB-1 off and on.

Wind and Rewind Model PB-A2 and PB-1 -

1. To rewind a portion of the tape or the entire reel, merely turn the "Wind-Rewind" knob to "Rewind" with the "Play-Idle" knob in "Idle." The tape will now rewind at a high rate of speed until the control knob is turned to "Neutral." (The speed change pin (9) should be set for 7-1/2" per second for the fastest wind or rewind.)

Note: Switching the direction of the "Wind-Rewind" knob i.e. from "Wind" to "Rewind" or vice versa, will act as a very effective brake in cutting down the speed of the reels. It is recommended that this method be used where fast stopping is necessary. However, it is better for the mechanism if this fast braking is used moderately.

2. If a portion of the tape is to be skipped it may be done by turning the control knob to "Wind" with the "Play-Idle" knob in "Idle." The tape will now wind forward at a high rate of speed until the knob is turned to "Neutral."

Caution: Never go from "Wind" or "Rewind" into the "Play" position without first bringing the reels to a stop. Failure to do so may result in tape spillage and possibly torn tape.

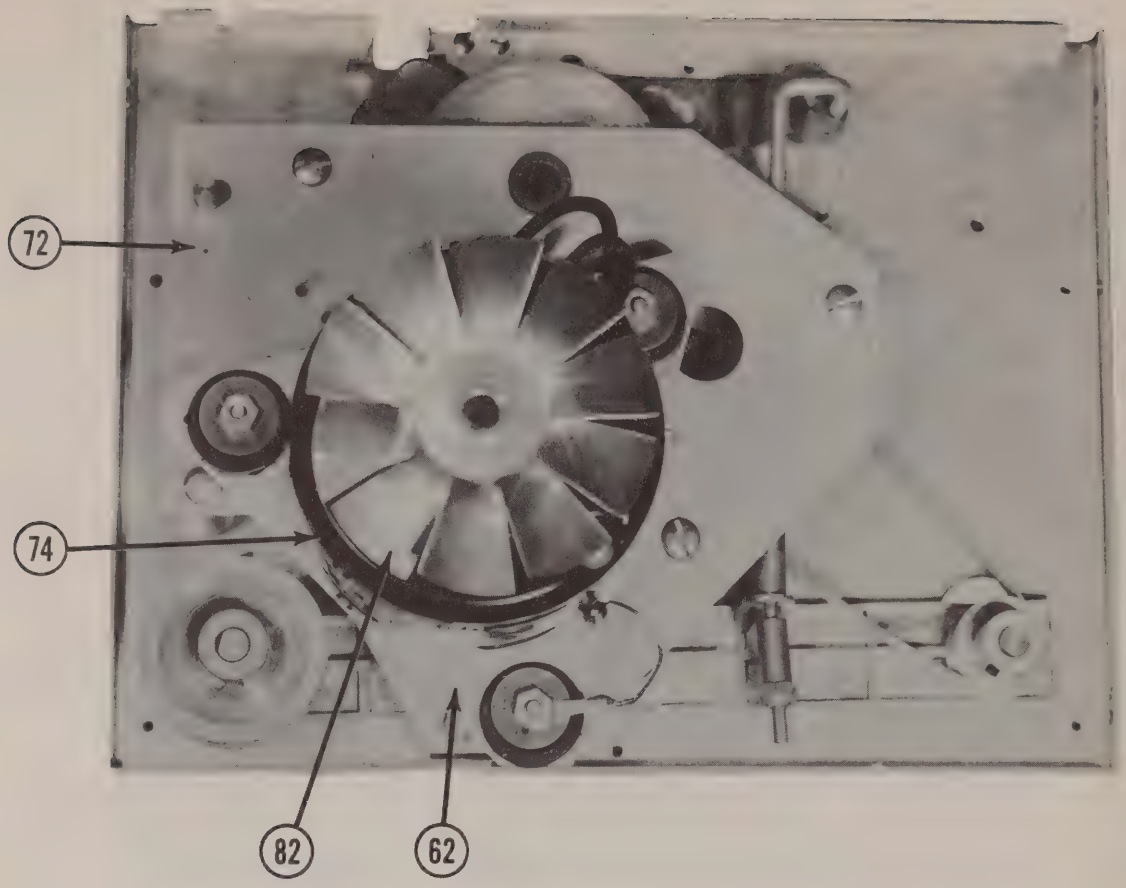

Figure 4.

Use of External Amplifier Model PB-A2-

1. Connect the input of the external amplifier to the "Ampl." output jack of the player, which is located on the right side of the top cover.

2. Turn the "Volume" control to about the midposition.

3. Turn the "Play-Idle" knob to "Play."

4. Use the volume and tone controls on the external amplifier.

5. The internal speaker may be silenced by plugging a shorted phone plug into the speaker output jack.

Use of External Speaker Model PB-A2 -

1. An external speaker (3.2 ohm voice coil) may be used with the PB-A2 by connecting a cable across the voice coil of the speaker and then plugging the other end into the "Speaker" output jack on the player.

2. For privacy of playback a set of low impedance earphones can be plugged into the "Speaker" output jack.

Functions of Principal Parts
Model PB-A2 and PB-1 -

Wind and Rewind (Refer to Figure 3).

When the control knob is turned to "Wind" the tie rod (59) is actuated, causing the equalizer bar (30) to be pivoted clockwise. This causes the take-up belt (44) to become taut, which, in turn, drives the take-up-spindle at a high rate of speed.

When this knob is turned to "Rewind," the equalizer bar (30) is pivoted counterclockwise by the tie rod, causing the feed belt (32) to become taut, thus causing the tape to rewind at a high rate of speed.

Play-Idle Control -

When the "Play-Idle" control knob is turned to "Play," the pressure roller slide plate (45) is actuated due to the slide plate being held against the control cam (69) by the pressure roller spring (48). This forward movement of the slide plate engages the pressure roller (15) with the capstan (67), which, in turn, drives the tape at a constant speed. The take-up bar (40), which is held against the end of the slide plate (45) by spring (46), is pivoted as the slide plate moves forward. This causes the boot on the take-up adjusting spring (41) to press against the equalizer bar (30) with just enough pressure for the take-up belt (44) to rotate the take-up spindle so as to wind the tape on the reel. This acts as a clutch by allowing the belt to slip, due to the slower speed of the capstan. Also by the movement of the slide plate (45) pressure is removed from lever (57) which has been engaged with the pressure pad pivot pin on the pressure arm lever (25) which holds the pressure pad away from the playback head. When the pressure is removed from the lever (57), the pressure pad spring (58) pulls the pressure arm lever (25) inward causing the pressure

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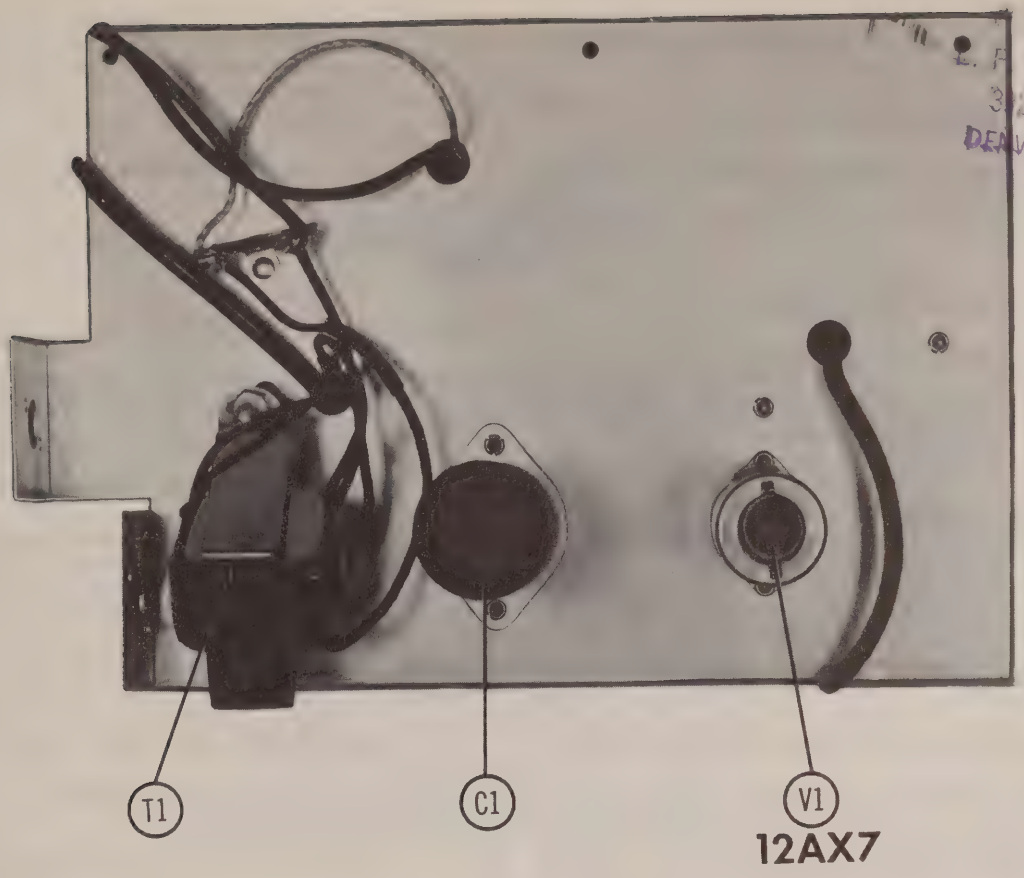


Figure 5, Top View of Model PB-1.

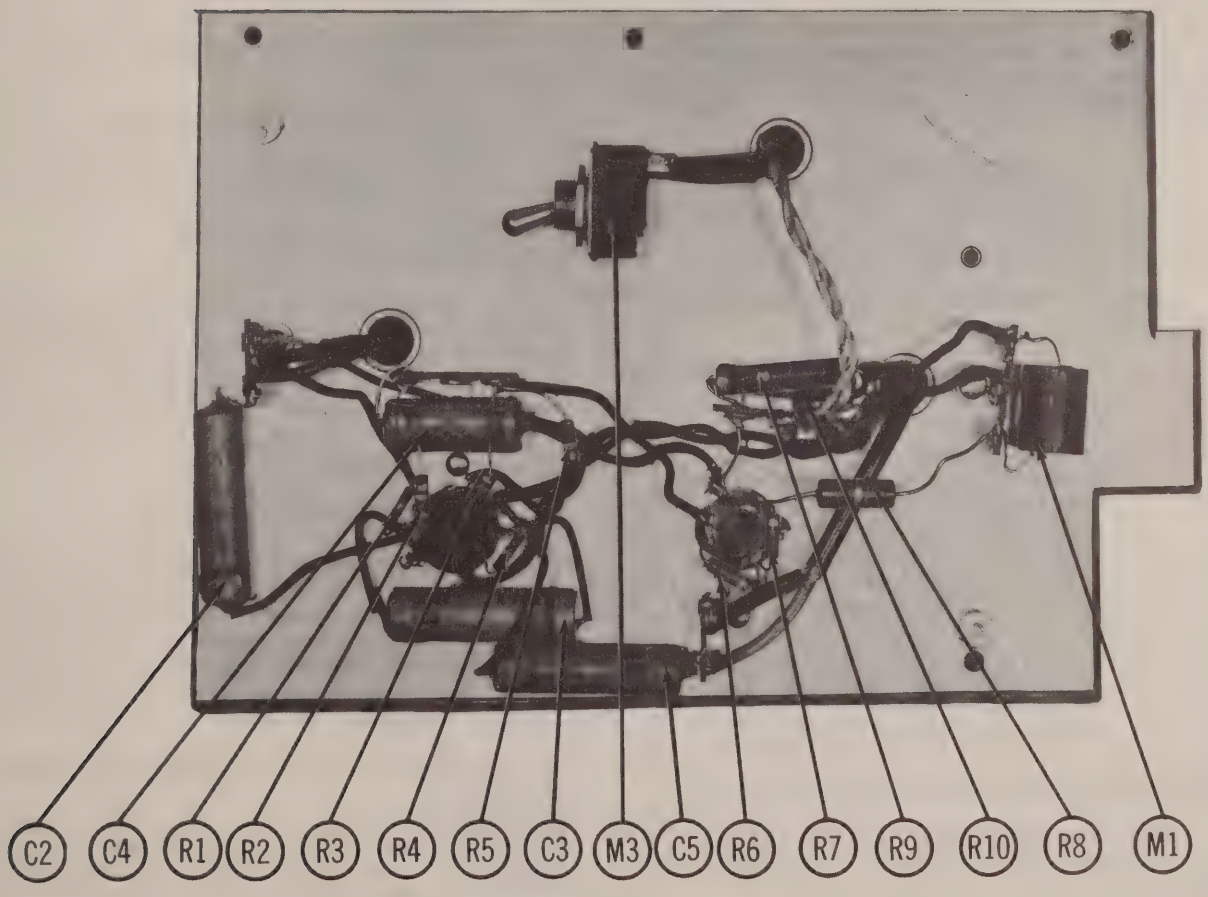


Figure 6, Bottom View of Model PB-1.

pad to bear against the tape to hold it in positive contact with the playback head.

Mechanical Interlock - (Refer to Figure 3) -

The automatic mechanical interlock (63) makes it impossible to actuate one control knob while the other is being used. Therefore, do not attempt to force the knobs.

ADJUSTMENTS
Model PB-A2 and PB-1

Traction or Drag on Reel Spindles -

This adjustment is made by loosening the cap screw (17) and shifting the equalizer bar (30) forward or backward. See Figure 2.

Make the adjustment as follows: With the controls in "Idle" and "Neutral," move the equalizer bar (30) to a position where when one of the reel spindles is grasped with the fingers and pushed backward and forward with rather firm pressure, the movement of the spindle is about an eighth of an inch. After making this adjustment be sure screw (17) is tightened securely.

Take-Up on Take-Up Reel - Model PB-A2 and PB-1 -

A take-up adjustment for the take-up reel is required if, when the control knob is placed in the "Play" position, a loop of tape feeds out from the capstan and roller (15) before the take-up reel starts turning, or if the take-up is excessive so as to load the motor and reduce the tape speed. This adjustment is accomplished by loosening the screw (41A), and holding the finger (41), see Figure 3. Moving the finger toward the equalizer bar decreases the time required for the take-up reel to start turning and moving the finger away from equalizer bar increases the time.

TROUBLES
Model PB-A2 and PB-1

Motor Runs but Flywheel (67) Fails to Turn -

1. Idler wheel (54) not contacting the motor pulley (70).

   (a) Check the speed control shaft (9) to see if it is properly positioned. If the control shaft (9) is midway between the speed setting of 3-3/4" per second and 7-1/2" per second, the idler wheel will not engage the motor pulley. The control shaft must be turned clockwise and pushed down as far as it will go for 7-1/2" per second or pulled upward as far as it will go for 3-3/4" per second.

   (b) Check spring (39) to see if it is properly connected. If this spring is not connected the idler wheel will not be held in engagement with the motor pulley.

Tape Rewinds at Fast Speed but Fails to Wind -

1. Check the equalizer bar (30) to see if it is adjusted properly. See "Traction or Drag on Reel Spindles."

2. Tie rod (59) out of adjustment.

   (a) Tie rod nut (28) located too near the end of the tie rod (59). Relocate nut (28) until the tape winds properly on the take-up reel in "Wind" position.

3. Take-up belt (44) worn badly or broken. Replace.

4. Take-up pulley (43) loose on take-up shaft (4).

Tape Winds at Fast Speed but Fails to Rewind -

1. Check the equalizer bar (30) to see if it is adjusted properly. See "Traction or Drag on Reel Spindles."

2. Tie rod (59) out of adjustment.

   (a) Tie rod nut (35) located too near the front of the player. Relocate nut (35) until the tape winds properly on the feed reel in the "Rewind" position.

3. Rewind belt (32) badly worn or broken. Replace.

4. Rewind pulley (31) loose. Tighten the pulley.

Tape Fails to Wind on Take-Up Reel When in "Play" Position -

1. Take-up belt (44) may be broken.

2. Rubber boot (41) not contacting equalizer bar. See "Take-Up on Take-Up Reel."

3. Take-up pulley (43) loose on shaft (4). Tighten.

4. Spring (46) not connected. See Figure 3.

5. Take-up spindle binding. Remove and clean.

Wind-Rewind Control Operates but Play-Idle Control Will not -

1. Spring (64) not connected. If spring (64) is not connected the automatic interlock (63) will not slide back into its normal position when the "Wind-Rewind" control is turned to "Neutral," therefore preventing the "Play-Idle" control from being turned.

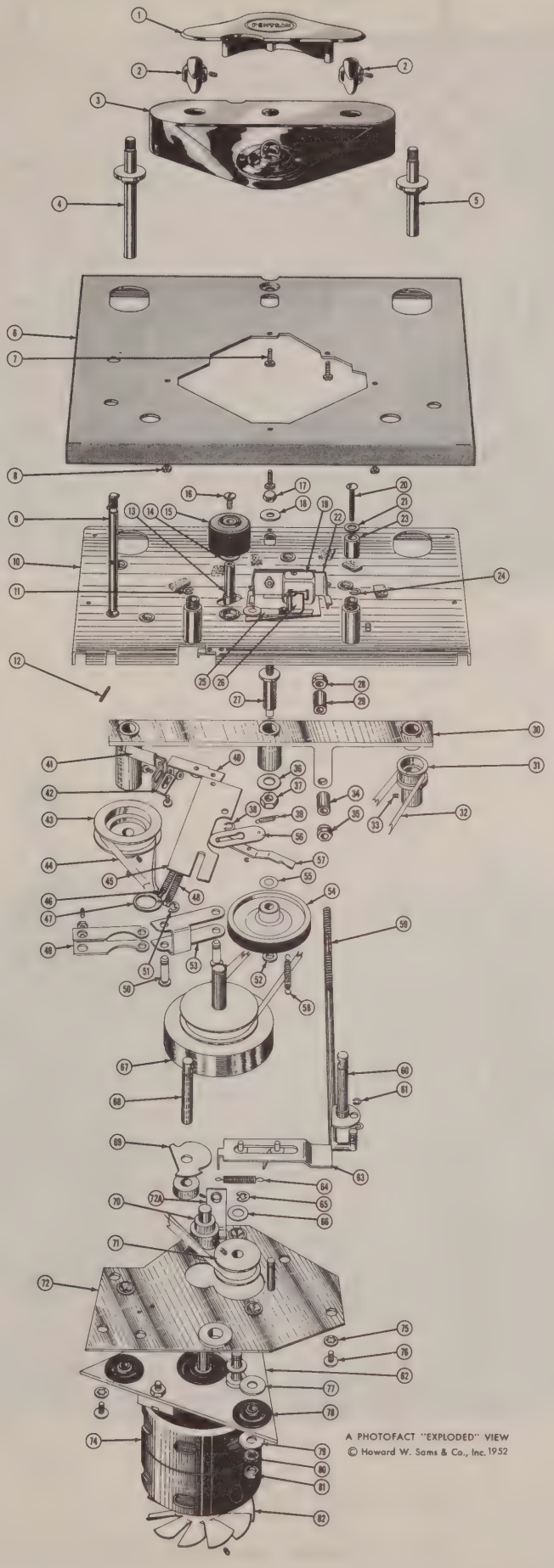
Poor Quality Playback -

1. Head pole piece dirty.

   (a) The pole piece on the playback head (19) is subject to an accumulation of tape coating residue, which is worn off the tape as it passes the head. This accumulation may be removed with carbon tetrachloride and a small cotton swab on the end of a toothpick.

2. Tape not being held in positive contact with the head.

   (a) Spring (58) not connected or is broken. If this spring is loose the pressure arm (25) will not be actuated when the control knob is turned to the "Play" position, thereby preventing the pressure pad from


A PHOTOFACT "EXPLODED" VIEW
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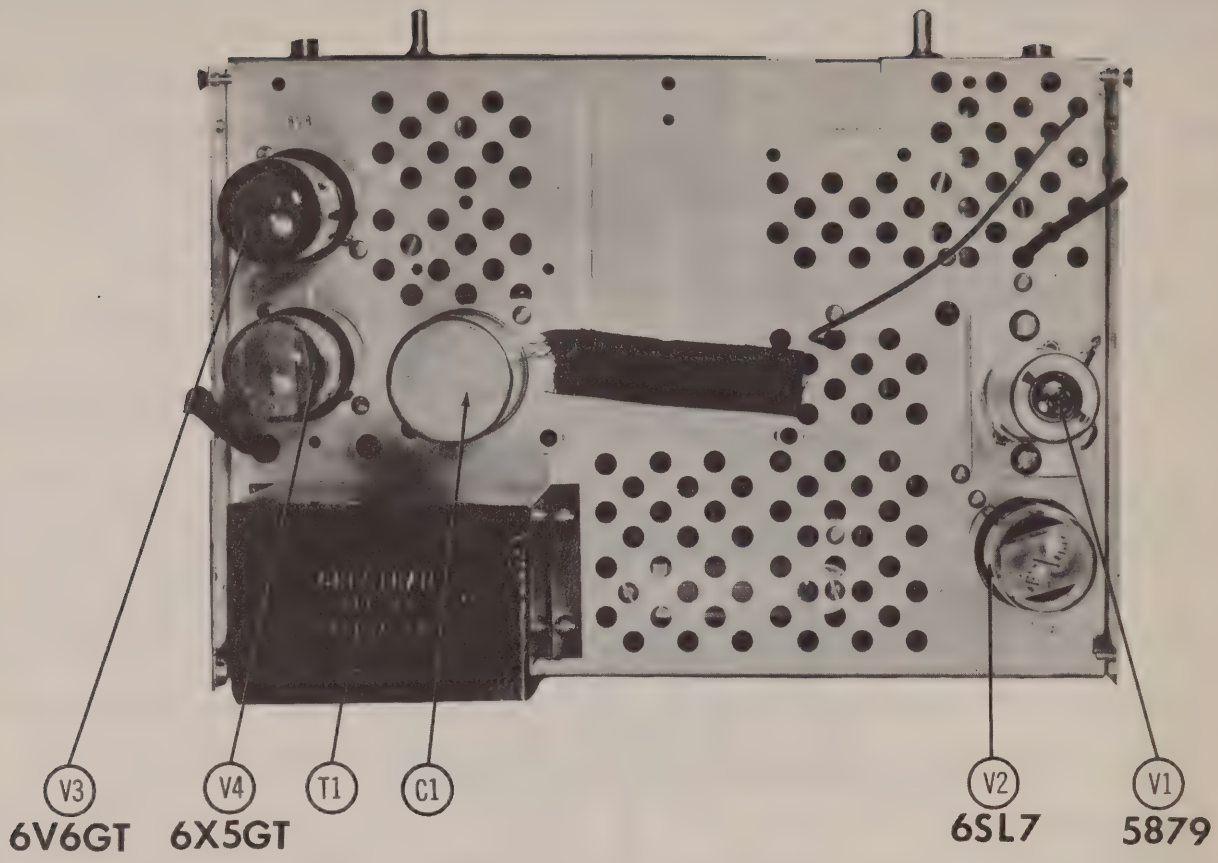


Figure 7, Top View Model PB-A2.

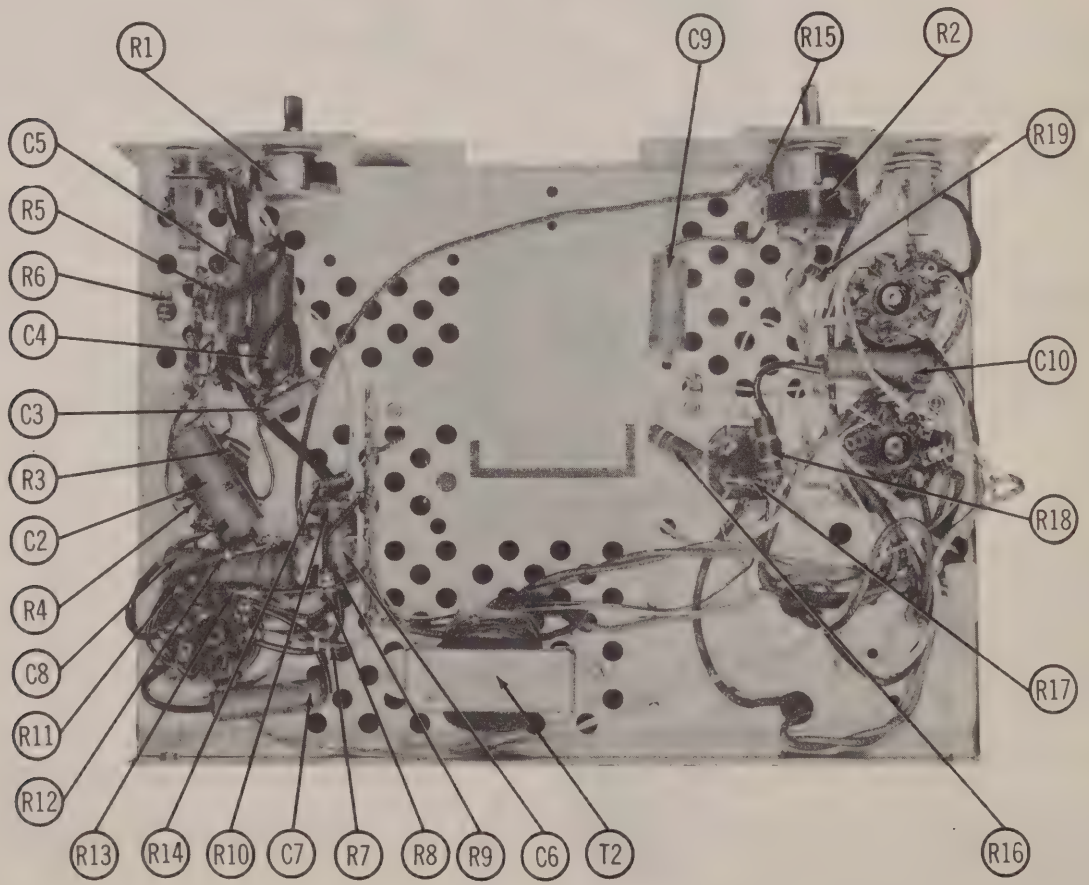
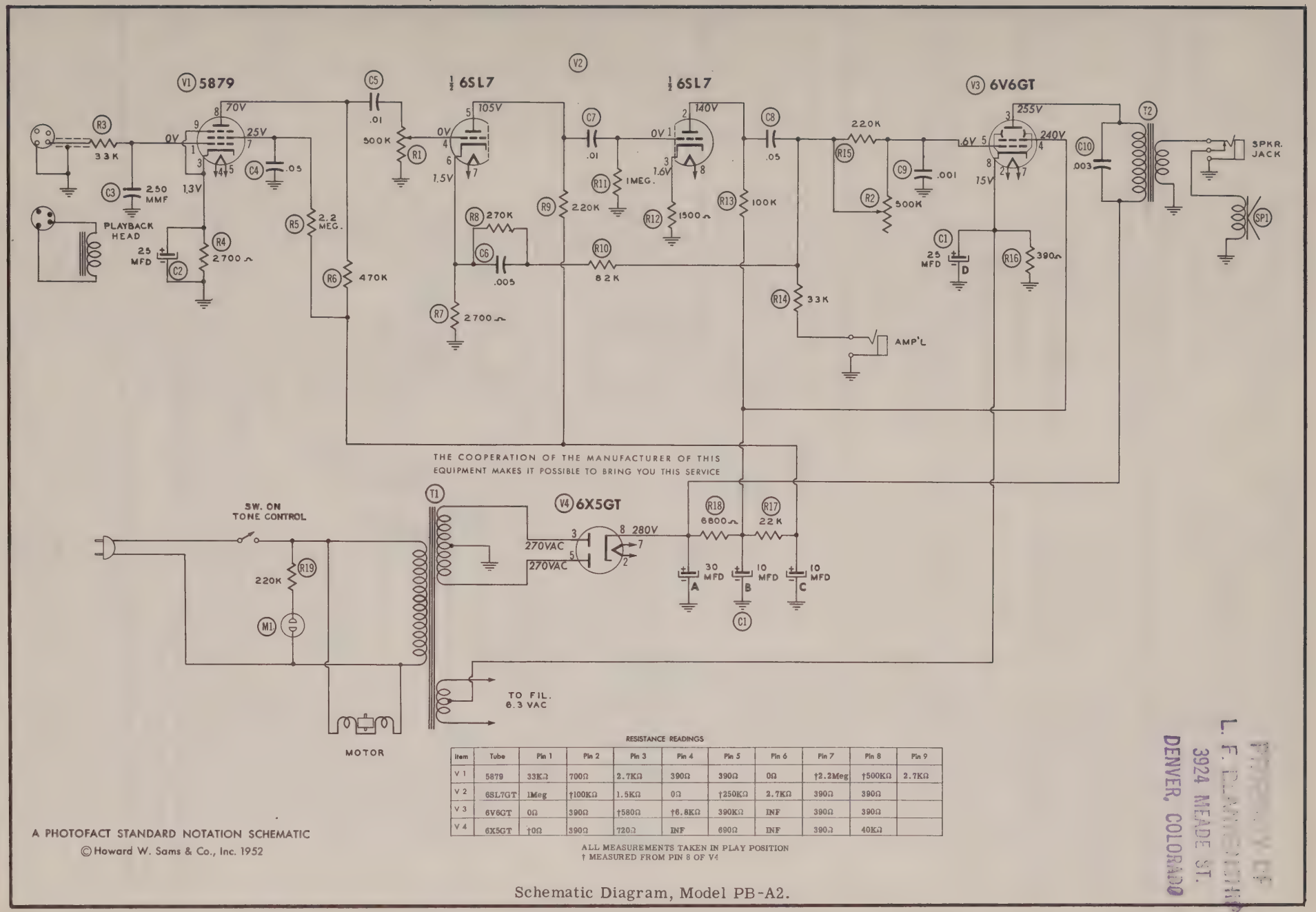


Figure 8, Bottom View Model PB-A2.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	5879	33KΩ	700Ω	2.7KΩ	390Ω	390Ω	0Ω	†2.2Meg	†500KΩ	2.7KΩ
V 2	6SL7GT	1Meg	†100KΩ	1.5KΩ	0Ω	†250KΩ	2.7KΩ	390Ω	390Ω	
V 3	6V6GT	0Ω	390Ω	†580Ω	†6.8KΩ	390KΩ	INF	390Ω	390Ω	
V 4	6X5GT	†0Ω	390Ω	720Ω	INF	690Ω	INF	390Ω	40KΩ	

ALL MEASUREMENTS TAKEN IN PLAY POSITION
† MEASURED FROM PIN 8 OF V4

Schematic Diagram, Model PB-A2.

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bearing against the tape and in turn the pole piece of the head. See Figures 2 and 3.

(b) Replace or connect spring (58).

3. Wrong type of tape.

(a) Use "A" tape. (Dull side of tape toward head.)

Speed Variation or "Wow" -

1. Check motor pulley (70), idler wheel (54), flywheel capstan (67), and pressure roller (15) for oil and foreign material.

(a) Clean with alcohol.

Caution: Do not use carbon tetrachloride to clean rubber surfaces as it may cause serious damage.

2. Check to see if the pressure roller (15) is making positive contact with the capstan (67).

(a) Slide plate (45) may be binding.

(b) Check spring (48) to see if it is connected.

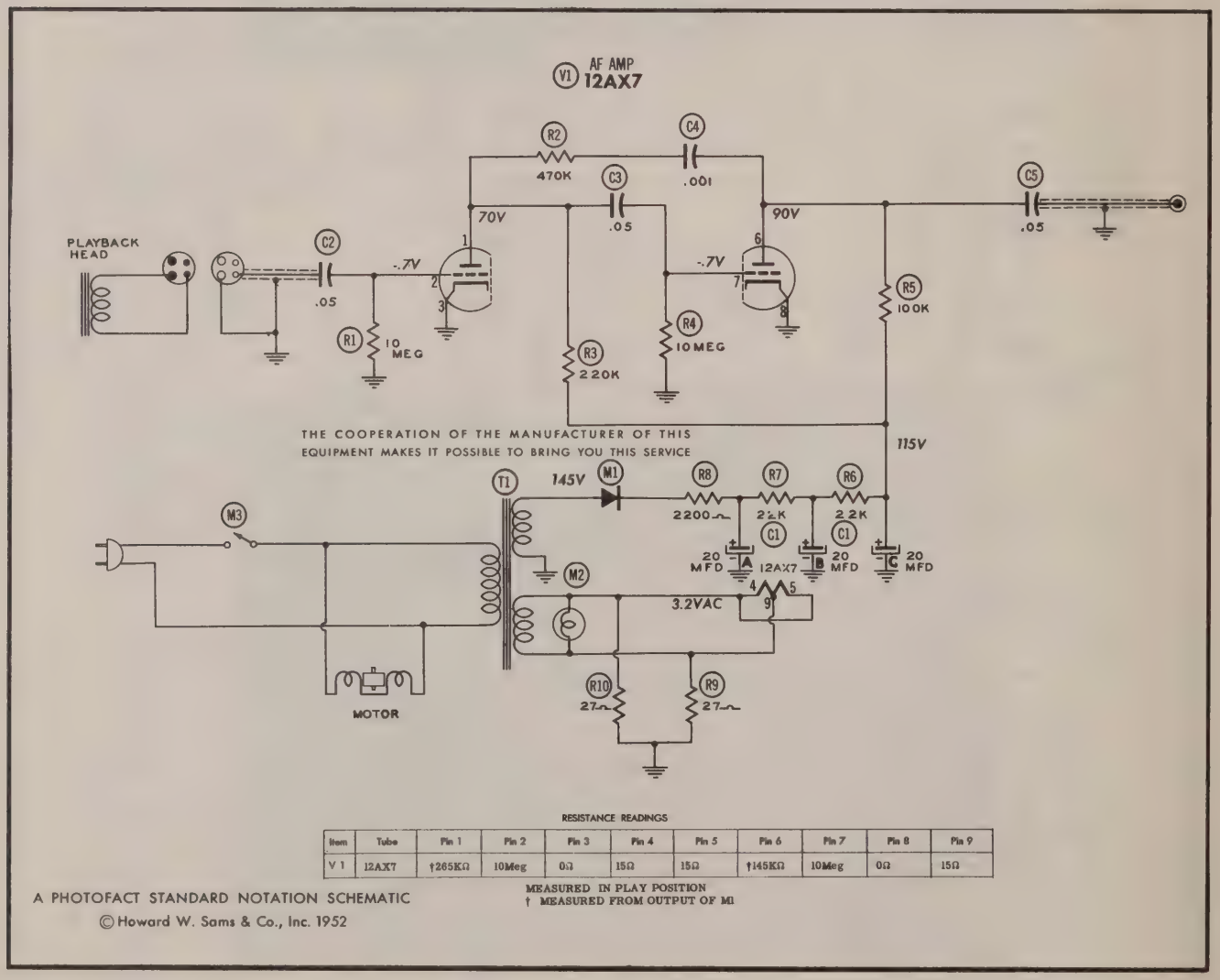
3. Check the equalizer bar (30) to see if it is properly adjusted. See "Traction or Drag on Reel Spindle" and "Take-Up on Take-Up Reel."

Noisy Capstan Bearing -

1. Apply a few drops of light oil to the bearing.

Excessive Tape Noise -

1. Head magnetized. Demagnetize head with a strong 60 cycle field gradually reducing the field to zero.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†265KΩ	10Meg	0Ω	15Ω	15Ω	†145KΩ	10Meg	0Ω	15Ω

A PHOTOFACT STANDARD NOTATION SCHEMATIC

MEASURED IN PLAY POSITION
† MEASURED FROM OUTPUT OF M1

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Schematic Diagram, Model PB-1

ELECTRICAL PARTS LIST PB-A2

Ref. No.	Part No.	Description
V1	5879	1st AF Amplifier
V2	6SL7	2nd AF Amplifier
V3	6V6GT	Power Output
V4	6X5GT	Rectifier
C1A	285-5064	Filter, 30 mfd. @ 350V
C1B		Filter, 10 mfd. @ 350V
C1C		Decoupling, 10 mfd. @ 350V
C1D		Power Output Cathode, 25 mfd. @ 25V
C2	273-2561	1st AF Amp. Cathode, 25 mfd. @ 25V
C3	232-2515-2	1st AF Amp. Grid, 250 mmf. @ 500V
C4	263-5034	1st AF Amp. Screen, .05 mfd. @ 400V
C5	263-1034	Audio Coupling, .01 mfd. @ 400V
C6	263-5024	2nd AF Amp. Cathode, .005 mfd. @ 600V
C7	263-1034	Audio Coupling, .01 mfd. @ 400 V
C8	263-5034	Audio Coupling, .05 mfd. @ 400V
C9	263-1024	Tone Compensation, .001 mfd. @ 600V
C10	232-3024	Power Output Plate, .003 mfd. @ 500V
R1	124-A-5043-7	Volume Control, 500K ohm, 1/2W
R2	126-A-50413-4	Tone Control and Switch, 500K ohm, 1/2W
R3	111-33321	1st AF Amp. Grid, 33K ohm, 1/2W
R4	111-27221	1st AF Amp. Cathode, 2700 ohm, 1/2W
R5	111-22521	1st AF Amp. Screen, 2.2 meg., 1/2W
R6	111-47421	1st AF Amp. Plate Load, 470K ohm, 1/2W
R7	111-27221	2nd AF Amp. Cathode, 2700 ohm, 1/2W
R8	111-27421	Tone Compensation, 270K ohm, 1/2W
R9	111-22421	2nd AF Amp. Plate Load, 220K ohm, 1/2W
R10	111-82321	Tone Compensation, 82K ohm, 1/2W
R11	111-10521	3rd AF Amp. Grid, 1 meg., 1/2W
R12	111-15221	3rd AF Amp. Cathode, 1500 ohm, 1/2W
R13	111-10421	3rd AF Amp. Plate Load, 100K ohm, 1/2W
R14	111-33321	Isolating, 33K ohm, 1/2W
R15	111-22421	Tone Compensation, 220K ohm, 1/2W
R16	111-39131	Output Cathode, 390 ohm, 1W
R17	111-22321	Filter, 22K ohm, 1/2W
R18	111-68231	Filter, 6800 ohm, 1W
R19	111-22421	Line Dropping, 220K ohm, 1/2W
T1	352-A-17	Power Transformer
T2	342-A-12	Output Transformer
SP1	345-B-13	PM Speaker (3.2 ohm Voice Coil)
M1	423-2	Neon Lamp, #NE-51
	552-8	Dial Socket, #204
	765-A-2	Amplifier Knobs

ELECTRICAL PARTS LIST PB-1

Ref. No.	Part No.	Description
V1	413-(12AX7)	AF Amp.
C1A	285-6062	Filter, 20 mfd. @ 400V
C1B		Filter, 20 mfd. @ 400V
C1C		Decoupling, 20 mfd. @400V
C2	263-5034	Audio Coupling, .05 mfd. @ 400V
C3	263-5034	Audio Coupling, .05 mfd. @ 400V
C4	263-1024	Tone Compensation, .001 mfd. @ 400V
C5	263-5034	Audio Coupling, .05 mfd. @ 400V
R1	111-10621	AF Amp. Grid, 10 meg. 1/2W
R2	111-47421	Tone Compensation, 470K ohm, 1/2W
R3	111-22421	Plate Load, 220K ohm, 1/2W
R4	111-10621	AF Amp. Grid, 10 meg. 1/2W
R5	111-10421	Plate Load, 100K ohm, 1/2W
R6	111-22321	Filter, 22K ohm, 1/2W
R7	111-22321	Filter, 22K ohm, 1/2W
R8	111-22231	Filter, 2200 ohm, 1 W
R9	111-27031	Filament Isolation, 27 ohm, 1W
R10	111-27031	Filament Isolation, 27 ohm, 1W
T1	352-19	Power Transformer
M1	454-A-6	Selenium Rectifier, 65 ma.
M2	422-51	#51 Pilot Lamp
M3	531-A-1	Toggle Switch

MECHANICAL PARTS LIST
Pentron PB-A2 and PB-1

Amt.	Part No.	Ref. No.	Description
1	824-B-1	1	Rear Trim Cover
2	765-A-1	2	Mechanism Knob
1	824-B-2	3	Front Trim Cover (Model PB-A2)
1	711-B-78		Front Trim Cover (Model PB-1)
1	964-A-80	4	Take Up Reel Spindle
1	964-A-82	5	Feed Reel Spindle
1	711-C-90	6	Top Cover Panel (Model PB-A2)
1	711-C-91		Top Cover Panel (Model PB-1)
2	612-60712	7	#6-3/8 Hex. Hd. Self-Tapping Screw. (To Hold Rear Trim Cover)
2	612-60712	8	#6-3/8 Hex. Hd. Self-Tapping Screw. (To Hold Front Trim Cover) Model PB-A2
2	624-9163		3/8-32 Hex. Nut (To Hold Front Trim Cover) Model PB-1
1	964-A-123	9	Speed Control Shaft
1	711-C-86	10	Top Mechanism Plate
1	619-14-8	11	1/4" Crescent Retaining Ring

MECHANICAL PARTS LIST (Cont.)
Pentron Model PB-A2 and PB-1

Amt.	Part No.	Ref. No.	Description
1	619-16-10	12	.078 X 5/8" Roll Pin
1	714-A-47	13	Roller Stud
1	616-A-3169	14	1/4 X 1/2 X .010 Clock Steel Washer
1	964-A-116	15	Capstan Pressure Roller
1	611-6035-3	16	6-32 X 3/16" B.H.M.S.
1	615-41264	17	Adjusting Nut for Equalizer Bar (Model PB-A2)
1	613-1089-6		10-32 X 1/2" Socket Cap Screw (Model PB-1)
1	616-324-4	18	Flat Washer (Model PB-A2)
1	616-114-4		#10 Flat Washer (Model PB-1)
1	617-113-4		#10 X 13/32 Lockwasher, Ext. Tooth (Model PB-1)
1	943-A-11	19	Playback Head
1	611-1161-5	20	10-32 X 1" R.H.M.S.
1	616-114-4	21	#10 Flat Washer
1		22	Head Mounting Bracket
1	714-A-102	23	Tape Guide Sleeve
1	619-14-6	24	3/16" Crescent Retaining Ring
1	964-A-114	25	Pressure Arm Lever
1	964-A-136	26	Felt Pressure Pad and Plate
1	871-A-22		Felt Pressure Pad
1		27	Equalizer Pivot Stud (Model PB-A2)
1	714-A-183		Equalizer Pivot Stud (Model PB-1)
1		28	Adjustment Nut for Tie Bar
1		29	Sleeve for Tie Bar
1	964-B-19	30	Equalizer Bar and Bearings
1	714-A-135	31	Rewind Pulley
1	899-2	32	Feed Belt 5/16" X 17-1/4"
2	613-80399	33	8-32 X 3/16" Allen Cup Point Set Screw
1		34	Sleeve for Tie Bar
1		35	Adjustment Nut for Tie Bar
1	616-A-7209	36	Flat Steel Washer (Model PB-A2)
1	615-3144	37	Hex. Nut (Model PB-A2)
1		38	Crescent Retaining Ring
1	712-A-22	39	Idler Spring
1	964-A-129	40	Take Up Adjusting Lever
1	964-A-121	41	Take Up Adjusting Spring
1	853-20	41A	Rubber Boot
1	711-A-209	42	Stop Plate
1	964-A-91	43	Take Up Pulley
1	899-3	44	Take Up Belt 5/16" X 12-5/8"
1	964-A-23	45	Slide Plate
1	712-A-5	46	Take Up Pressure Spring
1	711-A-207	47	Spring Ring
1	712-A-6	48	Pressure Roller Spring
1	711-A-343	49	Idler Channel
2	714-A-180	50	Idler Stud
1	619-14-6	51	3/16" "E" Retaining Ring
1	714-A-181	52	Idler Spacer
1	711-A-362	53	Idler Bracket
1	964-A-115	54	Idler Wheel
1	616-A-8169	55	.190 X 1/2 X .010 Clock Steel Washer
1	711-A-346	56	Idler Spring Clip
1	711-A-330	57	Play Pressure Lever
1	712-A-21	58	Pressure Pad Spring
1	714-A-184	59	Tie Rod
1	714-A-103	60	Wind and Rewind Shaft
2	619-14-6	61	3/16" Crescent Retaining Ring
1	964-A-126	62	Motor Plate
1	711-A-248	63	Rewind Interlock Bracket Bracket
1	712-A-8	64	Interlock Spring
1	619-A-8	65	1/4" Crescent Retaining Ring
2	616-A-3169	66	1/4" X 1/2 X .010 Clock Steel Washer
1	964-A-113	67	Flywheel Complete Assembly
1	964-A-40	68	Mechanism Cam Shaft Assembly
1	711-A-243	69	Cam
1	714-A-167	70	Motor Pulley
1	714-A-171	71	Belt Pulley
1	964-B-20	72	Motor Support Plate
1	711-A-361	72A	Support Bracket
2	611-10454	72B	10-32 X 1/4" Bind. H.M.S.
1	367-B-4	74	Universal Motor
2	714-A-173	74A	Motor Bar Support
1	367-B-6	74B	G.I. Motor
1	367-B-7	74C	Fasco Motor
4	617-112-4	75	#10 Int. Tooth Lockwasher
4	611-10554	76	10-32 X 5/16" B.H.M.S.
3	711-A-341	77	.205 X 7/8" X 1/32" Motor Mounting Washer
3	855-8	78	Shock Mounts
3	711-A-341	79	.205 X 7/8" X 1/32" Motor Mounting Washer
3	617-8114	80	#3 Int. Tooth Lockwasher
3	614-811-4	81	#8-32 Hex Head Nut
1	717-A-19	82	Motor Fan (Universal Motor)
1	717-A-20	82A	Motor Fan (G.I. Motor)
1	717-A-21	82B	Motor Fan (Fasco Motor)

PHOTOFACT* Folder

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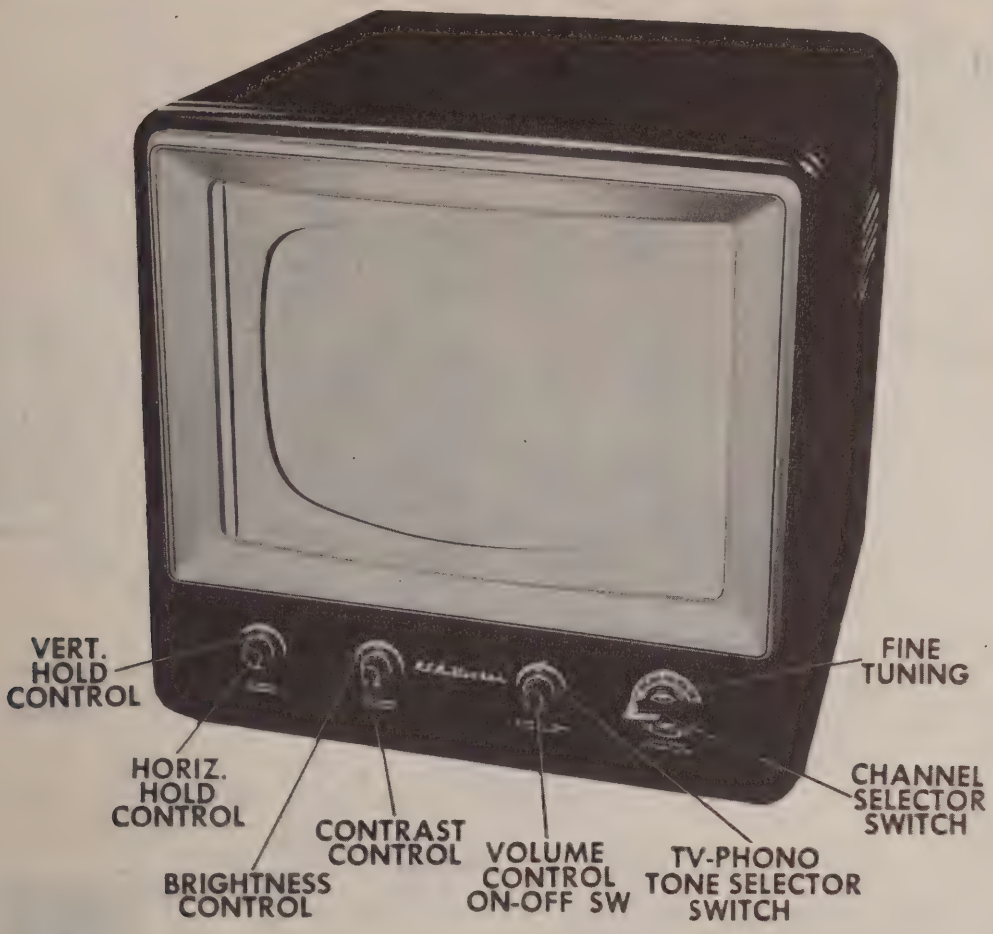

RCA VICTOR 17T200

TRADE NAME	RCA Victor Models 17T200, 17T201, 17T202, 17T211, 17T220, (Ch. KCS72); 21T208, 21T217, 21T218, 21T227, 21T228, 21T229 (Ch. KCS72A)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N. J.
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.9Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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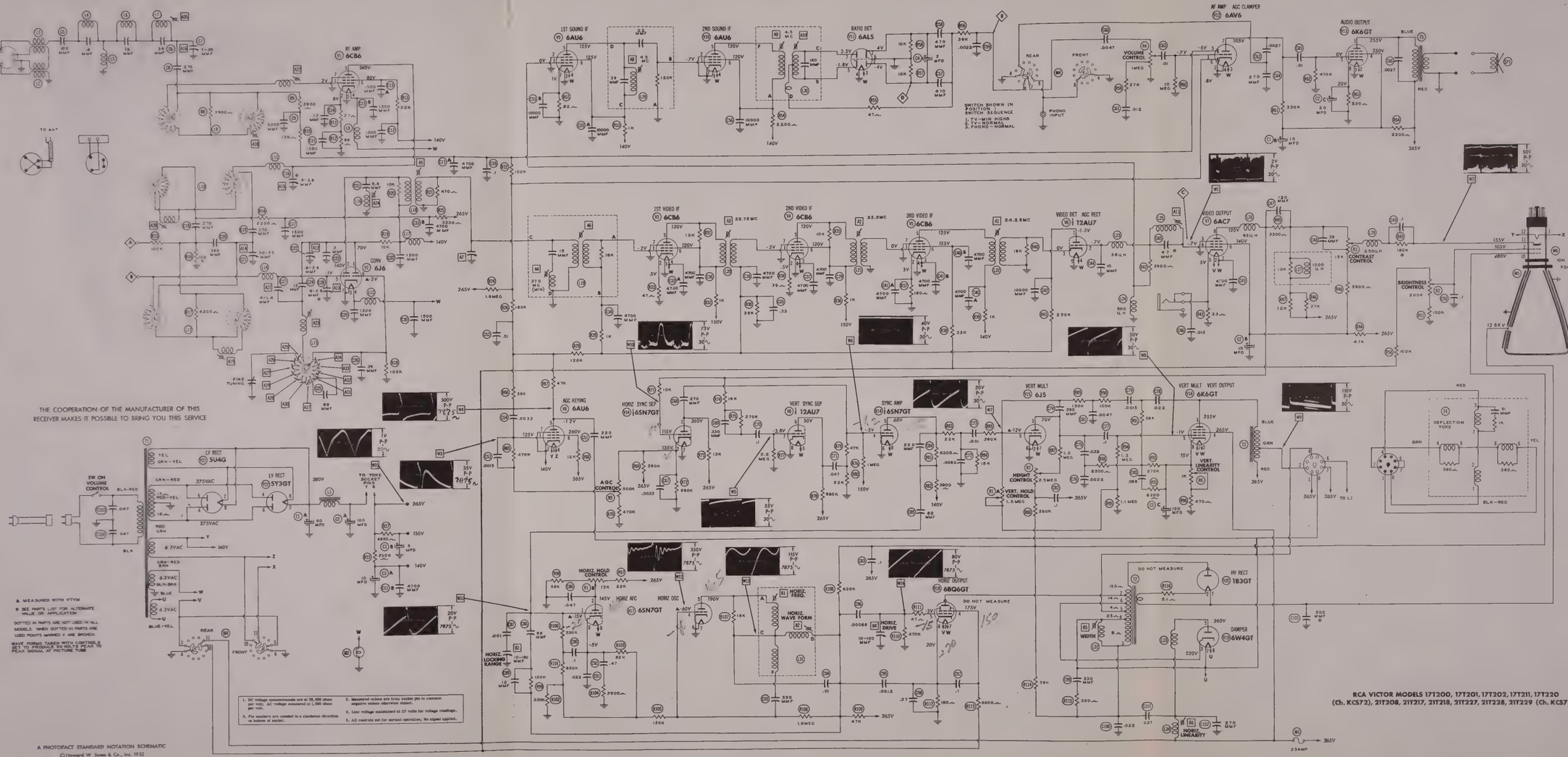

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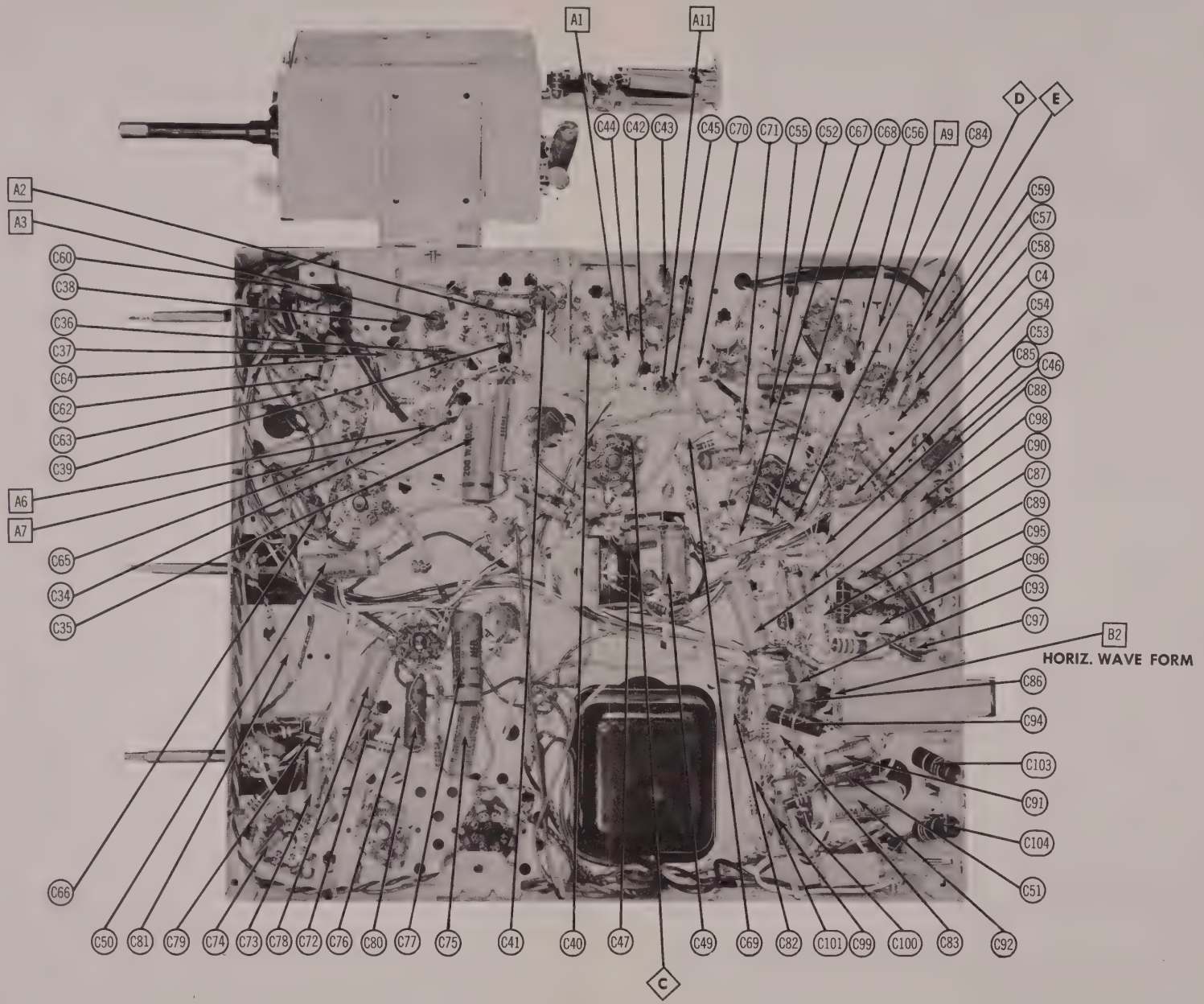
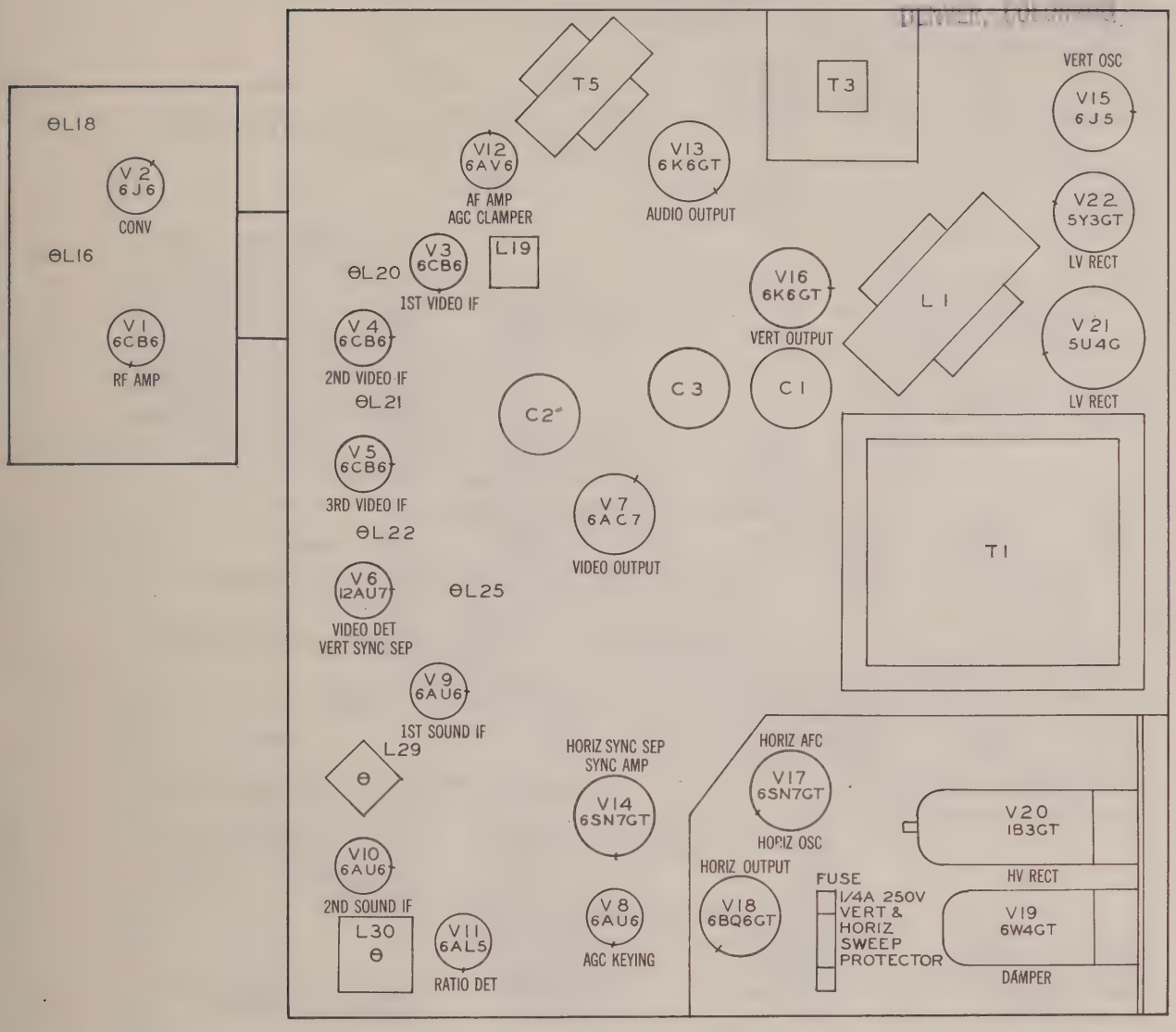
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V21, V22

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V7, V23
Has pic, No sound-V9, V10, V11, V12, V13
Overloaded picture-V8

SYNC FAILURE
No vert. sync.-V6, V14, V15
No horiz. sync.-V14, V17
No vert. or horiz.sync-V14

SWEEP FAILURE
No raster, has sound-V17, V18, V19, V20, V23 Fuse (M1)
No vertical deflection-V16
Poor vert. linearity or foldover-V15, V16
Poor horiz. linearity or foldover-V17, V18, V19
Narrow picture-V17, V18, V19, V20, V21, V22
Vert. off rfreq.-V14, V15
Horiz. off freq.-V14, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube (V17).
Connect a 1000Ω potentiometer across a 7.5 volts battery capable of withstanding appreciable current drain. This will be a source of variable bias for use during all gnment.

VIDEO IF ALIGNMENT

Connect the potentiometer arm of the bias box to the ungrounded side of C35. Connect the positive lead to chassis.
Adjust the potentiometer to supply -5 volts bias.
Turn the AGC Control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.0015MFD	High side to point B . Low side to chassis.	Not used	24.25MC (Unmod.)	9,10, or11	Use VTVM.DC probe to point C . Common to chassis.	A1	Adjust for maximum deflection.Attenuate generator to maintain 3 volt reading on VTVM.
2.	"	"	"	25.5MC	"	"	A2	"
3.	"	"	"	22.75MC	"	"	A3	"
4.	"	"	"	27.0MC	"	"	A4	Adjust for MINIMUM deflection. Maintain 3 volt reading on VTVM by adjusting generator output or reducing IF bias.
5.	"	High side to point B . Use short leads. Low side to tuner chassis.	24MC (10MC Swp)	22.25MC 25.5MC 27.0MC	Between Channels 2 and 13	Vert. Amp. thru probe (fig.1) to pin 5 of V3. Low side to chassis.	A5, A6, A7	Preset A7 to minimum capacity. Place 330Ω carbon resistor across primaries of L21 and L22 (term. A & B). Connect a 180Ω carbon resistor from pin 5 of V3 to terminal A of L20. Adjust A5 and A6 for curve of maximum amplitude with 25.5MC at 70% response as in Fig. 2. Adjust A7 until 22.25MC is at 70% response. Maintain .3 volt peak to peak response on scope on above adjustments.
6.	"	"	24MC (10MC Swp)	22.4MC 24.75MC 25.5MC 26.25MC	"	Vert. Amp. to point C . Low side to chassis.		Remove the two 330Ω resistor and the 180Ω resistor. Retouch A1, A2 and A3 for response of Fig. 3.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (grid) of 6AU6 (V6). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point D . Common to chassis.	A8, A9	Adjust for maximum deflection. Maintain generator output to give 6 volts DC at VTVM.
8.	"	"	"	"	DC probe to point E . Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (grid) of 6AU6 (V9). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point D . Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C4. Adjust for curve of maximum amplitude and symmetry as in Fig. 4.
8.	"	"	"	"	"	Vert. Amp. to point E . Low side to chassis.	A10	Reconnect capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	1000Ω Resistor	High side to pin 2 (grid) of 12AU7 (V6). Low side to chassis.	Not used	4.5MC (400%Mod)	Any	Vert. Amp. thru detector (Fig.1) to pin 8 (plate) of 6AC7 (V7). Low side to chassis.	A11	Short pin 1 of V5 to chassis to reduce noise indication on scope. Adjust A-11 for MINIMUM 400% indication on scope.

RF ALIGNMENT

Disconnect the coax link from terminal 2 of the tuner terminal board and connect a 39Ω carbon resistor between terminals 1 and 2.
Preset A5, A24 and A35 by backing the cores all the way out of the coils.
The bottom shield of the tuner must be in place during alignment.
Set the fine tuning control 30 degrees clockwise from the mechanical center of its range.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Fig. 6	Thru dummy to antenna terminals	Not used	236.75MC	13	Vert. Amp. to point A . Low side to chassis.	A12	Adjust for zero beat indication on scope. This will be indicated by a narrow trace between two wide traces.
11.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point A . Low side to chassis.	A13, A14, A15, A16	Turn the AGC control fully clockwise. Connect negative lead of 7.5 volt bias box to terminal strip and set bias at -3.5 volts. Adjust A13 thru A16 for response similar to Fig. 7.
12.	"	"	Not used	108.75MC	6	Vert. Amp. to point A . Low side to chassis.	A17	Adjust for zero beat indication as in Step 10.
13.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point A . Low side to chassis.	A18, A19, A20	Adjust for response similar to Fig. 7.
14.	"	"	"	"	"	"	A21	Connect VTVM to point A . Adjust A21 for -3 volts at VTVM. If necessary retouch A18, A19 and A20 for response as in Fig. 7. If necessary retouch A14 for proper bandwidth on channel 6. Repeat retouching adjustments until proper response is obtained and -3 volts are present at VTVM.

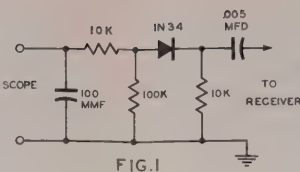


FIG.1

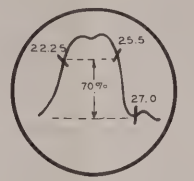


FIG.2

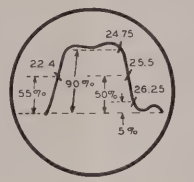


FIG.3

FIG.4

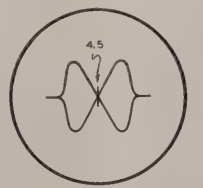


FIG.5

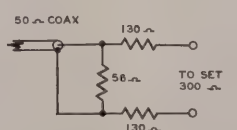


FIG.6

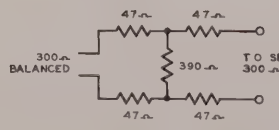


FIG.6

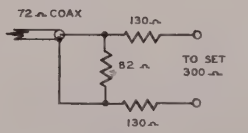


FIG.6

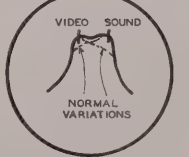


FIG.7

ALIGNMENT INSTRUCTIONS (CONT.)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	"	"	Not used	206.75 MC	8	Vert. Amp. to point A . Low side to chassis.	A12	Adjust for zero beat indication.
16.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	"	Vert. Amp. to point A . Low side to chassis.	A13, A15, A16	Readjust for response as in Fig. 7. Readjust A14 only if necessary.
17.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A22, A16	Adjust for maximum amplitude of curve between markers. Overshoot adjustment slightly in same direction as required to reach maximum from original setting. Adjust A16 for maximum amplitude of response.
18.	"	"	Not used	236.75MC	"	Vert. Amp. to point A . Low side to chassis.	A23	Adjust for zero beat indication on scope, then overshoot adjustment in same direction as required to reach zero beat from original setting. Readjust A12 for zero beat indication.
19.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	"	Vert. Amp. to point A . Low side to chassis.		Check for response as in Fig.7 with markers above 80%. If markers fall below 80% switch to channel 8 and readjust A13 and A16 as necessary. If A16 requires readjustment the adjustment should be overshot a small amount and corrected by adjustment of A22 to give maximum response between the markers. If the dip in the middle of the response curve is too great it can be flattened by turning A24 clockwise. If A24 is adjusted check channels 7 and 8 for any undesired trap action.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
20.	"	"	Not used	206.75	8	Vert. Amp. to point A . Low side to chassis.		Check oscillator setting. If necessary adjust A13, overshoot the adjustment and correct by adjusting A23.
21.	Repeat Step 12.							
22.	Repeat Step 13.							
23.	With VTVM at point A check oscillator injection voltage on channel 6. Adjust A21 for -3 volts, if necessary. If A21 is adjusted, switch to channel 6 and readjust A13 for proper curve shape, then recheck channel 6.							
24.	Fig. 6	Thru dummy to antenna terminals	Not used	236.75MC	13	Vert. Amp. to point A . Low side to chassis.	A12	Adjust for zero beat indication on scope.
				230.75MC	12		A35	
				224.75MC	11		A26	
				218.75MC	10		A27	
				212.75MC	9		A28	
				206.75MC	8		A29	
				200.75MC	7		A30	
				108.75MC	6		A17	
				102.75MC	5		A31	
				92.75MC	4		A32	
				86.75MC	3		A33	
				80.75MC	2		A34	
25.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A5	Adjust in clockwise direction to point of maximum bandwidth. Remove 39Ω resistor, reconnect coax link to tuner and repeat step 6 adjustment if necessary.

FM TRAP ADJUSTMENT

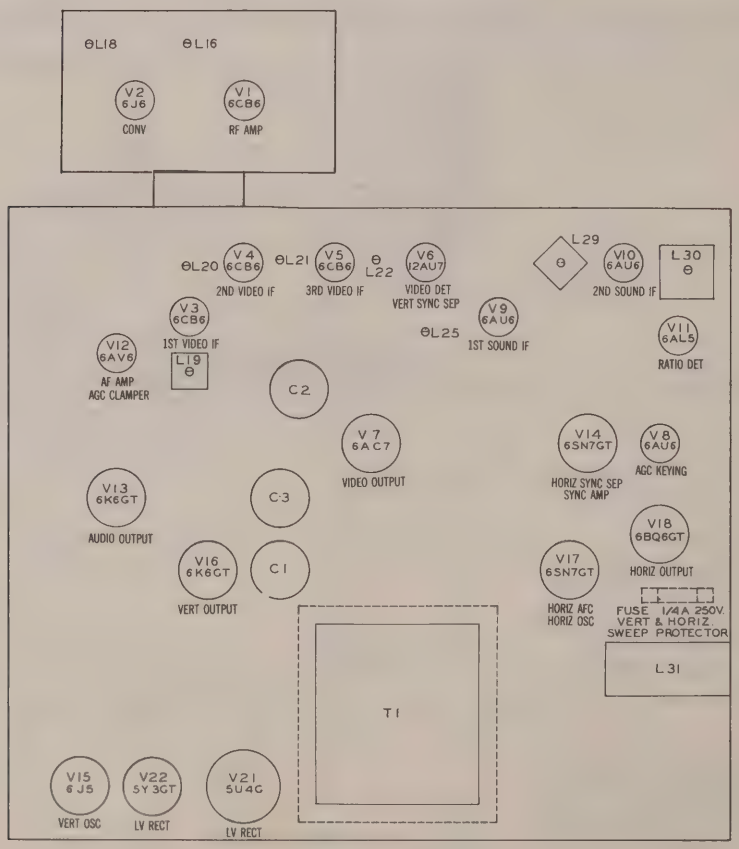
Tune in a TV station on which FM interference is noted and adjust A35 for minimum interference.

RCA VICTOR MODELS 17T200, 17T201, 17T202, 17T211, 17T220 (Ch. KCS72), 21T208, 21T217, 21T218, 21T227, 21T228, 21T229, (Ch. KCS72A)

RESISTANCE MEASUREMENTS

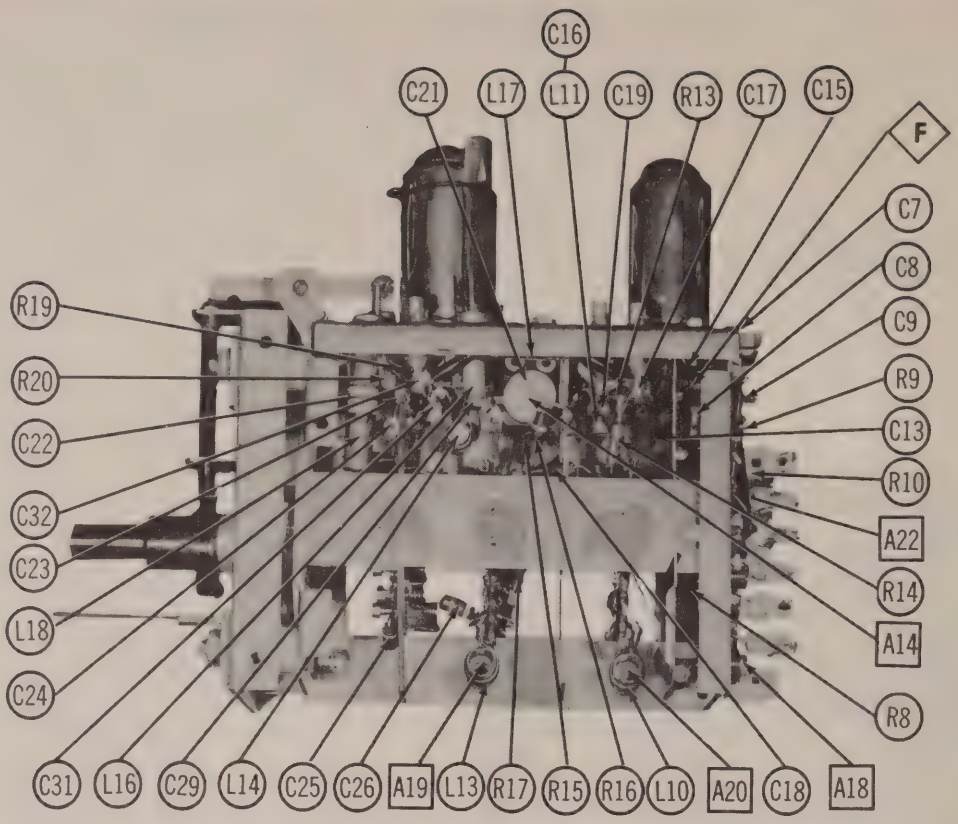
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	400KΩ	95Ω	0Ω	.1Ω	†5.5KΩ	†25KΩ	0Ω		
V 2	6J6	†12KΩ	†2.5KΩ	0Ω	.1Ω	100KΩ	100KΩ	0Ω		
V 3	6CB6	40KΩ	47Ω	0Ω	.1Ω	†5.7KΩ	†5.7KΩ	0Ω		
V 4	6CB6	39KΩ	39Ω	.1Ω	0Ω	†5.7KΩ	†5.7KΩ	0Ω		
V 5	6CB6	.5Ω	180Ω	.1Ω	0Ω	†3.5KΩ	†33KΩ	0Ω		
V 6	12AU7	260KΩ	3.9KΩ	.5Ω	.1Ω	.1Ω	†680KΩ	2.2Meg	0Ω	0Ω
V 7	6AC7	0Ω	0Ω	0Ω	3.9KΩ	33Ω	†17KΩ	.1Ω	†8.5KΩ	
V 8	6AU6	590KΩ	†2.5KΩ	■0Ω	■.1Ω	205KΩ	†12KΩ	†2.5KΩ		
V 9	6AU6	17Ω	0Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	82Ω		
V 10	6AU6	120KΩ	0Ω	0Ω	.1Ω	†4.7KΩ	†4.7KΩ	0Ω		
V 11	6AL5	10KΩ	10KΩ	.1Ω	0Ω	INF	0Ω	INF		
V 12	6AV6	10Meg	0Ω	.1Ω	0Ω	400KΩ	300K Ω	†330KΩ		
V 13	6K6GT	INF	.1Ω	†365Ω	†2.2KΩ	470KΩ	†2.2KΩ	0Ω	820Ω	
V 14	6SN7GT	†21KΩ	†15KΩ	210KΩ	69KΩ	†11KΩ	0Ω	0Ω	.1Ω	
V 15	6J5	0Ω	0Ω	#3.2Meg	#2 Meg	1.7Meg	INF	.1Ω	0Ω	
V 16	6K6GT	INF	.1Ω	†530Ω	†40Ω	2.3Meg	1.1Meg	0Ω	700Ω	
V 17	6SN7GT	1.5Meg	†45KΩ	412KΩ	480KΩ	†47KΩ	0Ω	0Ω	.1Ω	
V 18	6BQ6GT	INF	0Ω	INF	†6.8KΩ	470KΩ	INF	.1Ω	180Ω	Top Cap #14Ω
V 19	6W4GT	INF	INF	1 Meg	INF	†60K	INF	#29Ω	#29Ω	
V 20	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #164Ω
V 21	5U4G	INF	30KΩ	INF	18Ω	INF	17Ω	INF	30KΩ	
V 22	5Y3GT	INF	30KΩ	INF	17Ω	INF	18Ω	INF	30KΩ	
V 23	17QP4	■.1Ω	90KΩ	Pin 10 #56KΩ	Pin 11 †190KΩ	Pin 12 ■0Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PINS 8 OF V21 & 2 OF V22
# MEASURED FROM PIN 3 OF V19
■ MEASURED FROM 140 VDC LINE

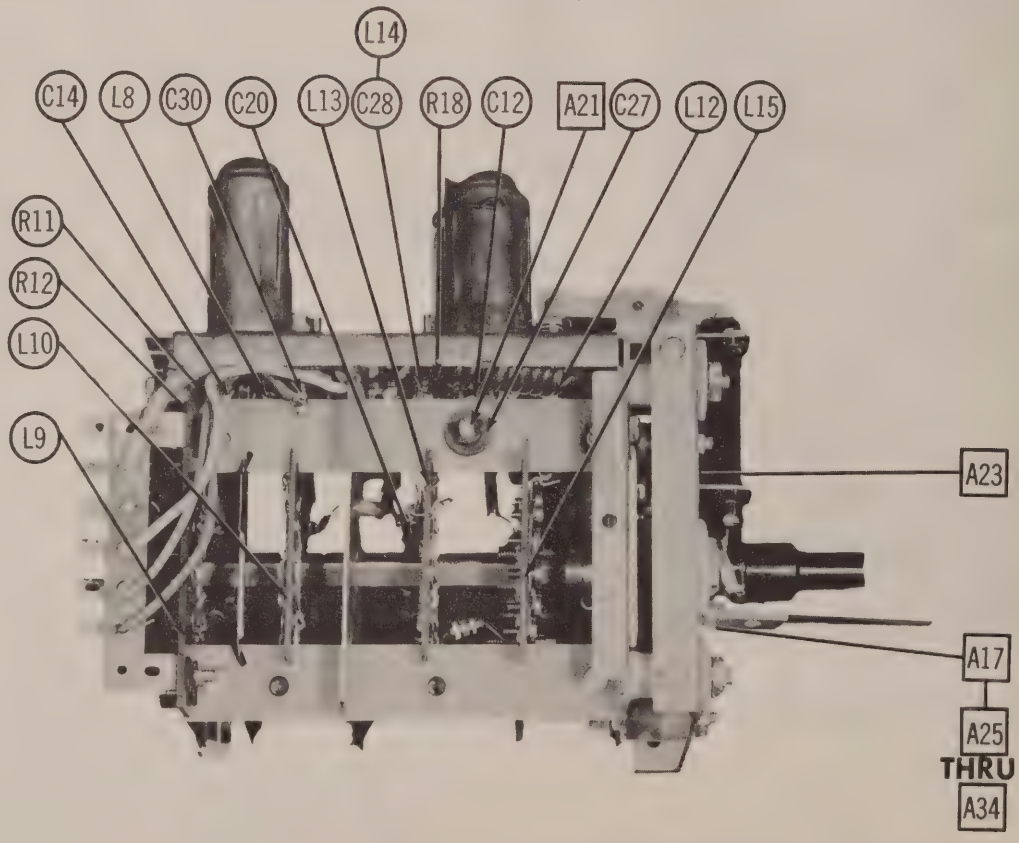


BOTTOM VIEW

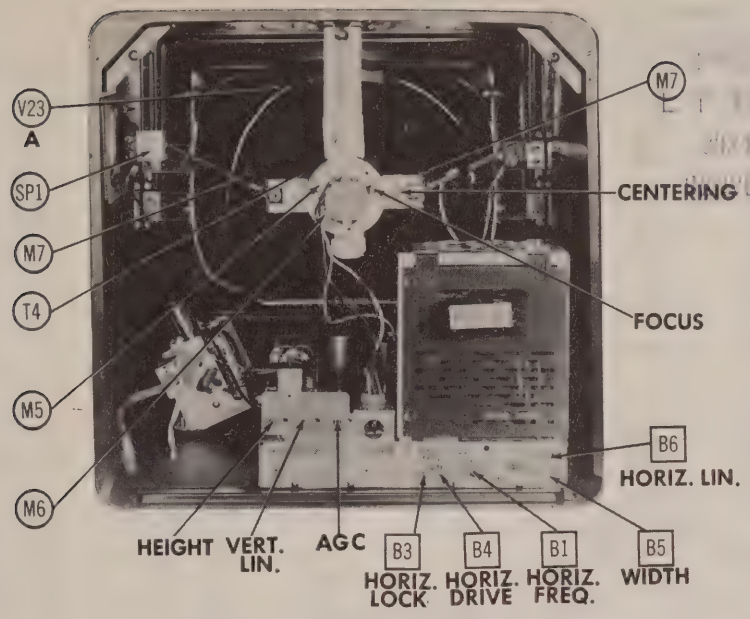
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
If the picture cannot be made to synchronize with the horizontal hold control, set the control in the middle of its range and adjust the horizontal frequency slug, (B1) for synchronization.
If still unable to obtain satisfactory horizontal sync it may be necessary to adjust the waveform slug, (B2).
Connect the low capacity probe of an oscilloscope to terminal C of L31 and view the waveform.
Turn the horizontal hold control 1/4 turn from clockwise so that the picture is in sync.
Adjust B2 until the broad and narrow peaks are of equal height. If necessary, keep the picture in sync during adjustment, by adjusting the horizontal hold.

HORIZONTAL LOCKING RANGE ADJUSTMENT

Set the horizontal hold control fully counter clockwise.
Momentarily remove the signal by switching to another channel and back. If the picture is in sync turn B1 slightly and remove the signal as before.
Repeat until the picture falls out of sync, with diagonal bars sloping to the left.
Slowly turn the horizontal hold clockwise and note the least number of bars just before the picture pulls into sync.
If more than 3 bars are present adjust the horizontal locking range trimmer, (B3) clockwise.
If less than 2 bars are present adjust B3 counter clockwise. Adjust B3 until 2 or 3 bars are present at the pull in point.
Turn the horizontal hold control to maximum clockwise.
Adjust B1 so that a diagonal bar appears, sloping down to the right. Reverse the adjustment until the bar moves off the screen, leaving the picture in sync.
Adjust the horizontal drive trimmer, (B4) to its maximum counter clockwise position without the presence of vertical lines or compression of the center of the picture.
Adjust the width slug, (B5) for picture slightly wider than necessary to fill the picture mask horizontally.
Adjust the horizontal linearity slug, (B6) for a picture that is symmetrical from left to right.

AGC THRESHOLD CONTROL ADJUSTMENT

Check the adjustment of the control by tuning to a strong signal, synchronizing the picture and switching off channel and back again.
If the picture reappears immediately the setting is satisfactory. If the picture requires an appreciable portion of a second to reappear, or bends excessively the control should be readjusted.
Turn the control fully counter clockwise.
A slight bend of the picture may be present but it should be disregarded. Turn the control clockwise until a slight bend or change of bend appears in the picture, then counter clockwise just enough to remove the bend or change of bend.
If unable to make the picture bend due to weak signal, turn the control clockwise until snow in the picture becomes more pronounced, then counter clockwise until the best signal to noise ratio is obtained.

PINCUSHION CORRECTION

Loosen the self tapping screws at the hinge of the arms on which the magnets are mounted and position the magnets to correct any pincushioning of the raster sides. Tighten the screws without disturbing the setting of the magnets. In some cases, it may be necessary to bend the magnets supports slightly for optimum correction.

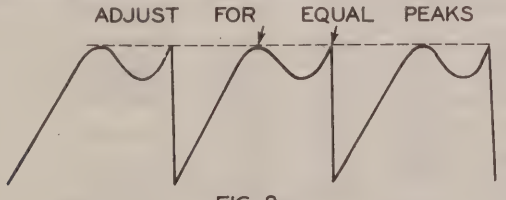


FIG. 8

DISASSEMBLY INSTRUCTIONS

1. Remove 8 push on type control knobs from front panel.
2. Disconnect antenna lead from tuner.
3. Remove 5 metal screws. Remove rear cover.
4. Disconnect speaker, yoke plug, Crt. socket & HV lead.
5. Remove 5 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

NOTE : FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA VICTOR PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6CB6	6CB6	7CM	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp	6CB6	6CB6	7CM	
V4	2nd Video IF Amp	6CB6	6CB6	7CM	
V5	3rd Video IF Amp	6CB6	6CB6	7CM	
V6	Video Det. - AGC Rect-Vert Sync Sep.	12AU7	12AU7	9A	
V7	Video Output	6AC7	6AC7	8N	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	1st. Sound IF Amp	6AU6	6AU6	7BK	
V10	2nd Sound IF Amp	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AF Amplifier - AGC Clamper	6AV6	6AV6	7BT	
V13	Audio Output	6K6GT	6K6GT	7S	
V14	Horiz. Sync. Sep. - Sync. Amplifier	6SN7GT	6SN7GT	8BD	
V15	Vert Multivibrator	6J5	6J5	6Q	
V16	Vert. Mult. - Vert. Output Horiz. AFC-Horiz.	6K6GT	6K6GT	7S	
V17	Oscillator	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	
V22	LV Rectifier	5Y3GT	5Y3GT	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: RCA VICTOR PART No.	SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V23A	17QP4	17QP4		12D	① Used on Chassis KCS72A only ② Circuit changes necessary
B	21AP4 ①	17LP4 ②			

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	RCA VICTOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	.80	400	76987	AFH2-62		UP8140		FP245	TVL-2672	
B	.10	350								
C2A	.100	400	76970	AFH4-135				FP431.4	TVL-3672	
B	.10	350								
C	.20	50								
C3A	.10	350	75218	AFH3-112		UPT1145 BRH5015		FP387.1	TVL-2750 TVA-1311	
B	.5	350								
C	150	50								
C4	5	50	74521	PRS150/4		BR550		TC30	TVA-1303	
C5	100		75437	5M100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C6	39		75450		TCZ-39		NP0K-390		5TCC-Q39	
C7	7-30		75189							
C8	270		75199	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C9	5000		73473	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C10	.1	200	73784	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C11A	4700		76990	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-2D47	
B	4700			BPD-005	DD-502	TM5D5	811-005	DC-525		
C12	1500		75166							
C13A	1500		75089	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C14	12		75200	SI12NP0	TCZ-12		NP0K-120	ZT-5412	5TCC-Q12	
C15	1500		73748	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C16	3-8.8		75183							Note 1
C17	1500		75166							
C18	270		75199	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C19	270		75199	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C20	390		75641	SI390	D6-391		GP2K-391	UC-5339	5GA-T39	
C21	50-75		75174							
C22	3-8.8		75184							
C23	3		76968							
C24	15		45465	SI15NP0	TCZ-15		NP0K-150		5TCC-Q15	
C25	.68		71504		TCZ-.68		NP0K-R68			
C26	39		75196							
C27	.8-1.4		75172							
C28	.8-3.8		75182							Note 2
C29	1500		73746	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C30	1500		75166							
C31	6.8		75197	SI6.8NP0			NP0K-6R8	ZT-5568	5TCCB-V68	
C32	1500		75166							
C33A	4700		76990	BPD-005	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	4700			BPD-005		TM5D5	811-005	DC-525		
C34	4700		73473	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C35	.33	200	76994							
C36	4700		73473	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C37	4700		73473	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C38	4700		73473	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C39	4700		73473	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C40A	4700		76990	BPD-005	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	4700			BPD-005		TM5D5	811-005	DC-525		
C41A	4700		76990	BPD-005	DD-2-502	TM5D5	811-005	DC-525	5HK-2D47	
B	4700			BPD-005		TM5D5	811-005	DC-525		
C42	10000		73960	BPD-01	DD-103	TM581	821-01	DC-521	5HK-81	
C43	4700		73473	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C44	19		33098	SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C45	47		76983	SI47NP0	TCZ-47			ZT-5447	5TCC-Q47	Note 3
C46	.015	400	73797	P488-015		PTE68I5		PT415	4TM-S15	
C47	130	500	39830	1469-00015		5R5T15		MCB236	MS-315	
C48	39		73664		TCZ-39		NP0K-390		5TCC-Q39	
C49	.1	200	73784	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C50	.1	400	73551	P488-1	DF-104	PTE4P1		PT401	2TM-P1	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	VOLT	RCA VICTOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C51	220		76673				PTE4S1	GP2-333-103	PT411	4TM-S1
C52	.01	400	73561	P488-01	D6-103		PTE6D15	GP2L-152	PT6215	6TM-D15
C53	.0015	600	76508	P688-0015	D6-152		PTE6D33	GP2-333-332	PT6233	6TM-D33
C54	.0033	600	73795	P688-0033	D6-332		PTE6D33	GP2-333-332	PT6233	6TM-D33
C55A	10000		76991	BPD-01	DD-3-103	TM5D81	821-01	DC-511	5HK-281	
B	10000			BPD-01	DD-103	TM581	821-01	DC-511	5HK-81	
C56	10000		73960	BPD-01		5R5T5		DC-511	MS-35	
C57	470	500	39644	1469-0005		5R5T5		MCB245	MS-35	
C58	470	500	39644	1469-0005		5R5T5		MCB245	MS-35	
C59	.0022	600	73595	P688-0022	D6-222		PTE6D22	GP2-333-222	PT6222	6TM-D22
C60	.0047	600	73920	P688-0047	D6-472		PTE6D47	GP2-333-472	PT6247	6TM-D47
C61	.012	200	74938	P488-015			PTE4S1		TP400	4TM-S1
C62	.01	400	73561	P488-01	D6-103		PTE4S1	GP2-333-103	PT411	4TM-S1
C63	.0027	600	73599	P688-003	D6-272		PTE6D3	GP2-333-272	PT623	6TM-D3
C64	270		47616							
C65	.01	400	73561	P488-01	D6-103		PTE4S1	GP2-333-103	PT411	4TM-S1
C66	.0027	1000	73818				PTE16D3		PT1623	MB-D3
C67	.0033	600	73795	P688-003	D6-332		PTE6D33	GP2-333-332	PT6233	6TM-D33
C68	270	1000	73091	1468L-HV-0003					MCK327	
C69	330	500	39640							
C70	.1	400	73551	P488-1	DF-104		PTE4P1		PT401	4TM-P1
C71	.047	200	73558	P288-047	DF-503		PTE4S47		PT4147	2TM-S47
C72	.0082	400	73808							
C73	.001	600	75643	P688-001	D6-102		PTE6D1	GP2L-102	PT621	6TM-D1
C74	390	1000	73094	1468L-HV-0004			5WP15T4			
C75	.033	600	73596	P688-033			PTE6S3		PT6133	6TM-S3
C76	.0022	600	73595	P688-0022	D6-222		PTE6D22	GP2-333-222	PT6222	6TM-D22
C77	.1	600	73557	P688-1	DF-104		PTE6P1		PT601	6TM-P1
C78	.022	600	73798	P688-022	DF-203		PTE6S22		PT6123	6TM-S22
C79	.0015	1000	77123							MB-D15
C80	.068	200	73792	P288-068			PTE4S68			4TM-S68
C81	.0047	600	73920	P688-0047	D6-472		PTE6D47	GP2-333-472	PT6247	6TM-D47
C82	.1	400	73551	P488-1	DF-104		PTE4P1		PT401	4TM-P1
C83	.1	400	73551	P488-1	DF-104		PTE4P1		PT401	4TM-P1
C84	220	1000	75248	1468L-HV-00025					MCK322	
C85	82	2000	76474							
C86	.047	400	73553	P488-047	DF-503		PTE4S47		PT4147	4TM-S47
C87	.001	600	75643	P688-001	D6-102		PTE6D1	GP2L-102	PT621	6TM-D1
C88	68	1000	76475						MCL468	
C89	12		33380					N750K-120		
C90	.1	400	73551	P488-1	DF-104		PTE4P1		PT401	4TM-P1
C91	.022	400	73562	P488-022			PTE4S22		PT4122	4TM-S22
C92	.47	200	73787	P288-47			PJ2P5		PT405	2TM-P47
C93	330	1000	76476						MCK333	
C94	.01	600	73594	P688-01			PTE6S1		PT611	6TM-S1
C95	.0012	600	76995	P688-0015			PTE6D15			6TM-D15
C96	.00068	600	76479	SI680	D6-681			GP2K-681	UC-5368	5GA-T68
C97	.1	600	73557	P688-1			PTE6P1		PT601	6TM-P1
C98	.27	200	73788	P488-25			PJ2P25		PT4025	2TM-P25
C99	330	1000	76476						MCK333	
C100	.022	1000	73810				PTE16S25		PT6122	MB-S22
C101	.027	1000	73811				PTE16S3		PT613	MB-S3
C102	270	1000	73091						MCK327	
C103	.047	400	75071	489ZGXY-05			PJ4S47		PT4147	4TM-S47
C104	.047	400	75071	489ZGXY-06			PJ4S47		PT4147	4TM-S47
C105	500	20000	76461	HV20C			MMC-20T5	413-501		20DK-T5

Note 4

Note 1 RCA part # also includes L11.
Note 2 RCA part # also includes L14.
Note 3 RCA part # also includes L25.
Note 4 Used in chassis KCS72A only.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	RCA VICTOR PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.2Meg		76994	QJ-346 *	RTV-357			Vert. Hold-Panel
B	75KΩ							Horiz. Hold -Rear
R2A	200KΩ		76444	QJ-325 **				Brightness
R3	15KΩ		76445	QI3-118XX				Contrast-Tap. ② 4875Ω & 10KΩ
R4A	1 Meg		77010	QI3-137X	AK-98	ABT-73	UT-438	Volume-Tap ② 280KΩ
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R4A
R5A	500KΩ		76975	QI1-133	AG-58-S	AB-59	SU-50	AGC
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	1000Ω		76976	QI1-108	AG-8-S	AB-5	U-4	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R7A	2.5Meg		76448	QI1-239	AG-84-S	AB-83	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A

* CONCENTRIKIT EQUIVALENT -KIT K-2, BASE ELEMENTS & SHAFTS B11-138 & P1-200 (Panel) B11-125 & R1-216 (Rear).

** CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B11-129 & P1-200(Panel) REAR (None) & R5-215.

RESISTORS

ITEM No.	RATING: OHMS	WATT	RCA VICTOR PART No.	IRC PART No.	NOTES
R8	3900Ω		503293	BTS-3900	
R9	3900Ω		503239	BTS-3900	
R10	150Ω		504115	BTS-150	
R11	27Ω		503027		
R12	68Ω		503068		
R13	22KΩ		503322		
R14	2200Ω		503222	BTS-2200	
R15	100KΩ		504410		
R16	100KΩ		504410		
R17	8200Ω		503282		
R18	100KΩ		504410		
R19	10KΩ		504310		
R20	10KΩ-5%		502310		
R21	470Ω		503147	BTS-470	
R22	100KΩ	½	504410		
R23	2500Ω	10	76469		
R24	1.8Meg 5%	½	11769	BTS-1.8Meg 5%	
R25	3300Ω	½	504233	BTS-3300	
R26	180KΩ-5%	½	502418	BTS-180K-5%	
R27	4850Ω	7	76989		
R28	1000Ω	½	504210	BTS-1000	
R29	120KΩ-5%	½	30180	BTS-120K-5%	
R30	39KΩ	½	50339	BTS-39K	
R31	12KΩ-5%	½	502312		
R32	1000Ω	½	504210	BTS-1000	
R33	47Ω-5%	½	502047		
R34	39Ω-5%	½	502039		

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	WATT	RCA VICTOR PART No.	IRC PART No.	NOTES
R35	10KΩ-5%	½	502310		
R36	1000Ω	½	504210	BTS-1000	
R37	180Ω-5%	½	502118	BTS-180K-5%	
R38	33KΩ	1	513333	BTA-33K	
R39	1000Ω	½	504210	BTS-1000	
R40	18KΩ	½	503318	BTS-18K	
R41	220KΩ	½	504422	BTS-220K	
R42	3900Ω-5%	½	502239	BTS-3900-5%	
R43	33Ω 5%	½	503033		
R44	47KΩ-5%	½	30787	BTS-47K-5%	
R45	3300Ω	1	513233	BTA-3300	
R46	27KΩ	1	513327	BTA-27K	
R47	12KΩ	2	523312	BTB-12K	
R48	5600Ω	½	503256	BTS-5600	
R49	180KΩ	½		BTS-180K	Note
R50	100KΩ	½	503410	BTS-100K	
R51	100KΩ	½	503410	BTS-100K	
R52	82Ω	½	503082	BTS-82	
R53	1000Ω	½	504210	BTS-1000	
R54	2200Ω	½	503222	BTS-2200	
R55	47Ω	½	503047		
R56	39KΩ	½	503339	BTS-39K	
R57	10KΩ-5%	½	502310	BTS-10K-5%	
R58	10KΩ-5%	½	502310	BTS-10K-5%	
R59	27KΩ	½	503327	BTS-27K	
R60	10Meg	½	504610	BTS-10Meg	
R61	330KΩ	½	503433	BTS-330K	
R62	470KΩ	½	503447	BTS-470K	
R63	820Ω	1	76988	BTA-820	
R64	2200Ω	½	503222	BTS-2200	
R65	470KΩ	½	504447	BTS-470K	
R66	56KΩ	½	503356	BTS-56K	
R67	47KΩ	½	504347	BTS-47K	
R68	12KΩ	½	503312	BTS-12K	
R69	560KΩ	½	503456	BTS-560K	
R70	470KΩ	½	503447	BTS-470K	
R71	10KΩ	½	504310	BTS-10K	
R72	680KΩ	½	503468	BTS-680K	
R73	15KΩ	½	503315	BTS-15K	
R74	18KΩ	½	503318	BTS-18K	
R75	270KΩ	½	503427	BTS-270K	
R76	1 Meg	½	503510	BTS-1 Meg	
R77	2.2Meg	½	503522	BTS-2.2Meg	
R78	680KΩ	½	503468	BTS-680K	
R79	47KΩ	½	503347	BTS-47KΩ	
R80	22KΩ	½	503322	BTS-22K	
R81	8200Ω	1	513282	BTA-8200	
R82	3900Ω-5%	½	502239	BTS-3900-5%	
R83	22KΩ	½	503322	BTS-22K	
R84	18KΩ	½	503318	BTS-18K	
R85	390KΩ	½	503439	BTS-390K	
R86	560KΩ	½	503456	BTS-560K	
R87	1.2Meg-5%	½	503512	BTS-1.2Meg-5%	
R88	8200Ω	½	503282	BTS-8200	
R89	150KΩ	½	503415	BTS-150K	
R90	100KΩ	1	513410	BTA-100K	
R91	56KΩ-5%	1	512356	BTA-56K-5%	
R92	270KΩ-5%	½	502427	BTS-270K-5%	
R93	5%				
R93	8200Ω	½	503282	BTS-2800	
R94	1.2Meg-5%	½	503512	BTS-1.2Meg-5%	
R95	1.1Meg	½	502511	BTS-1Meg	
R96	470Ω	1	513147	BTS-470	
R97	22KΩ	1	513322	BTA-22K	
R98	68KΩ	1	513368	BTA-68K	
R99	150KΩ	½	503415	BTS-150K	
R100	330KΩ	½	503433	BTS-330K	
R101	820KΩ	½	503482	BTS- 820K	
R102	330KΩ-5%	1	512433	BTA-330K-5%	
R103	82KΩ	1	513382	BTA-82K	
R104	3900Ω	½	503239	BTS-3900	
R105	150KΩ-5%	1	513415	BTA-150K-5%	
R106	1.8Meg-5%	1	39063	BTA-1.8Meg 5%	
R107	18KΩ	½	503318	BTS-18K	
R108	820KΩ	1	503482	BTS-820K	
R109	47KΩ-5%	1	512347	BTA-47K-5%	
R110	470KΩ	½	503447	BTS-470K	
R111	47Ω	½	504047		
R112	180Ω	2	76639	BW-2-180	
R113	6800Ω	2	523268	BTB-6800	
R114	56KΩ	½	503356	BTS-56K	
R115	560Ω	1	513156	BTA-560	
R116	5.1Ω	½	76796		

Some models use 150KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	RCA VICTOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117V AC ② 1.9A	550V CT .275A DC	5V AC ② 4.8A SEC. 4 6.3V AC ② 1.2A	6.3V AC ② .8A SEC. 5 6.3V AC ② 6.9A	76984				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	DC RESISTANCE SEC.	RCA VICTOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	20Ω Tap ② 8Ω, 33Ω, 37Ω, 51Ω	0Ω	76795		HVO-9			Horiz. Output Trans.
T3	485Ω Tap ② 15Ω		76978	A-8113 ①②		TSO-11 ②	A-101U ①②	Vert. Output Trans.
T4A	24Ω		76616	DY-9A	MDF-70	TY-3	Y-17	Horiz. Deflection Coils.
B	45Ω							Vert. Deflection Coils.

① Tie the Red & Green leads together
② Mount on top of chassis.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	RCA VICTOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T5	6.8KΩ	3.4Ω	325Ω	.6Ω	76982 76997 ①	A-3878	A-2931	RO-13	S-7X	① Alternate Audio Output Trans.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	RCA VICTOR PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.4Ω	77000 75022 ① 76389 ②	ST-105 Mod. P5-X	5A07	① 8" Speaker used in models 17T211 & 17T220 ② 12" Speaker used in models 21T218, 21T227 & 21T228.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	RCA VICTOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.260A	39.8Ω	1.24 Hy	76498	C-2326 ①	C-2996 ①	TR-1733 ①	C-17X ①

① Drill one new Mtg. hole

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	RCA VICTOR PART No.	MERIT PART No.	IRC PART No.	
L2	Ant. Coil	.5Ω	.4Ω	76977			
L3	Ant. Coil	.5Ω	.4Ω	76977			Part of L2, Part No. also includes L4, L5, L6 & L7
L4	IF Trap	.6Ω		75242			Includes 18MMF capacitor
L5	Ant. Coil Shunt	.5Ω		75241			
L6	IF Trap	.6Ω		75242			Includes 18MMF capacitor
L7	FM Trap	0Ω		75449			Includes 39MMF capacitor
L8	Fil. Choke	0Ω					
L9	Ant. Coils	0Ω		75180			Complete with rotor, coils, C8, C9, R8, R9, & R10.
L10	RF Coils	0Ω		76964			Complete with rotor, coils, C19 & R14
L11	RF Coil	0Ω		75183			Includes C16
L12	Fil. Choke	0Ω					
L13	Mixer Grid Coils	0Ω		75178			Complete with rotor, coils, C18, C20, R15, R16 & R17
L14	Mixer Grid Coil	0Ω		75182			Includes C28
L15	Osc. Coils	0Ω		76963			Complete with rotor, coils, C24 & C25
L16	Mixer Plate Coil	0Ω		75185			
L17	RF Choke	.3Ω		75202		CLA	.56 Microhenry
L18	Conv. Plate	.3Ω	.1Ω	75181			
L19	1st Video IF	.1Ω	.3Ω	76979			Includes Trap, 15MMF capacitor & 18KΩ resistor
L20	2nd Video IF	.5Ω	.5Ω	76980			
L21	3rd Video IF	.5Ω	.5Ω	76980			
L22	4th Video IF	.5Ω	.5Ω	76980			
L23	Series peaking Coil	3.2Ω		76011	TV-180		36 Microhenry
L24	Shunt Peaking Coil	17Ω		75252	TV-188		500 Microhenry
L25	4.5MC Trap	3.4Ω		76983	TV-151		Includes C45
L26	Series Peaking Coil	4.6Ω		71527	TV-181		93 Microhenry
L27	Shunt Peaking Coil	27Ω		77124			1000 Microhenry, Wound on 10KΩ resistor
L28	Series Peaking Coil	8Ω		71526	TV-185		250 Microhenry
L29	Sound IF	1.6Ω		76981			Includes 22MMF capacitor & 120KΩ res.
L30	Ratio Det.	10.5Ω	.3Ω CT	77112	TV-110		Tertiary Winding .25Ω
L31	Horiz. Osc.	90Ω	50Ω	76440	TV-162		Primary Tap @ 23Ω
L32	Width Coil	12Ω		76441	MWC-1		
L33	RF Choke	.72Ω		76640		CL-1	1.5 Microhenry
L34	Horiz. Lin.	21Ω		76442	MWC-1		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA VICTOR PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	Bel	1/4 A 250V			318.250 (3AG-P/T)		GJV-1/4	

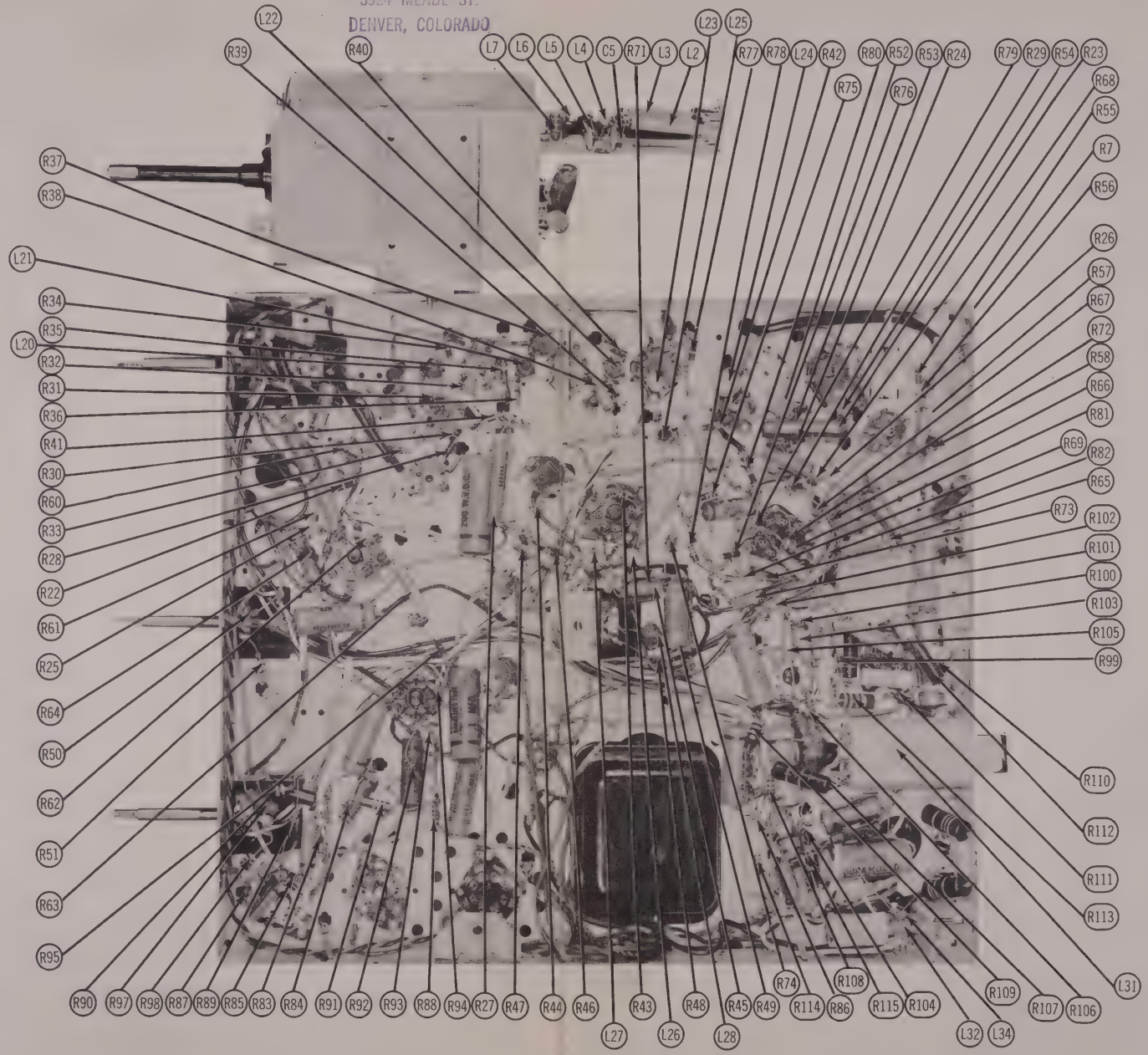
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RCA VICTOR PART No.		
M2	Bayonet	7.5	.2	White	11765		Type No. #51

MISCELLANEOUS

ITEM No.	PART NAME	RCA VICTOR PART No.	NOTES
M3	RF ATuner	KRK8D	
M4	Switch	77011	TV-Phono Tone
M5	Focus Magnet	76168	
M6	Ion Trap	76141	
M7	Magnets	76633	Anti-Pin Cushion Correction
B3, B4	Trimmer	75217	Dual Horiz. Lock, Horiz. Drive (10-160MMF)
A7	Trimmer	71496	Coupling Adj. (5-70MMF)
	Knob	76595	Brightness, Vert. Hold. (Maroon)
	Knob	76593	Channel Selector (Maroon)
	Knob	76591	Fine Tuning (Maroon)
	Knob	74963	Contrast, Horiz. Hold, Off/On Volume (Maroon)
	Knob	76597	TV-Phono Tone (Maroon)
	Knob	76596	Brightness, Vert. Hold (Beige)
	Knob	76594	Channel Selector (Beige)
	Knob	76592	Fine Tuning (Beige)
	Knob	75464	Contrast, Horiz. Hold Off/On Volume (Beige)
	Knob	76598	TV-Phono Tone (Beige)
	Knob	77264	Brightness, Horiz. Hold (Ebony)
	Knob	77261	Channel Selector (Ebony)
	Knob	77262	Fine Tuning (Ebony)
	Knob	77265	Contrast, Horiz. Hold & Off/On Volume (Ebony)
	Knob	77263	TV-Phono Tone (Ebony)
	Knob	76625	Brightness Vert. Hold (Tan)
	Knob	76624	Channel Selector(Tan)
	Knob	76623	Fine Tuning (Tan)
	Knob	74001	Contrast, Horiz. Hold & Off/On Volume (Tan)
	Knob	76626	TV-Phono Tone (Tan)
	Escutcheon	75459	Channel Light Mask (Burgundy)
	Escutcheon	76589	Channel Light Mask (Beige)
	Escutcheon	77267	Channel Light Mask (Ebony)
	Safety Glass		For 17" Picture Tubes
	Safety Glass		For 21" Picture Tubes
	Back Cover	77189	Models 17T201, 17T202
	Back Cover	77190	Models 17T221, 17T220
	Back Cover	77211	Models 21T208, 21T217, 21T218, 21T227, 21T228, & 21T229.

3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
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DENVER, COLORADO

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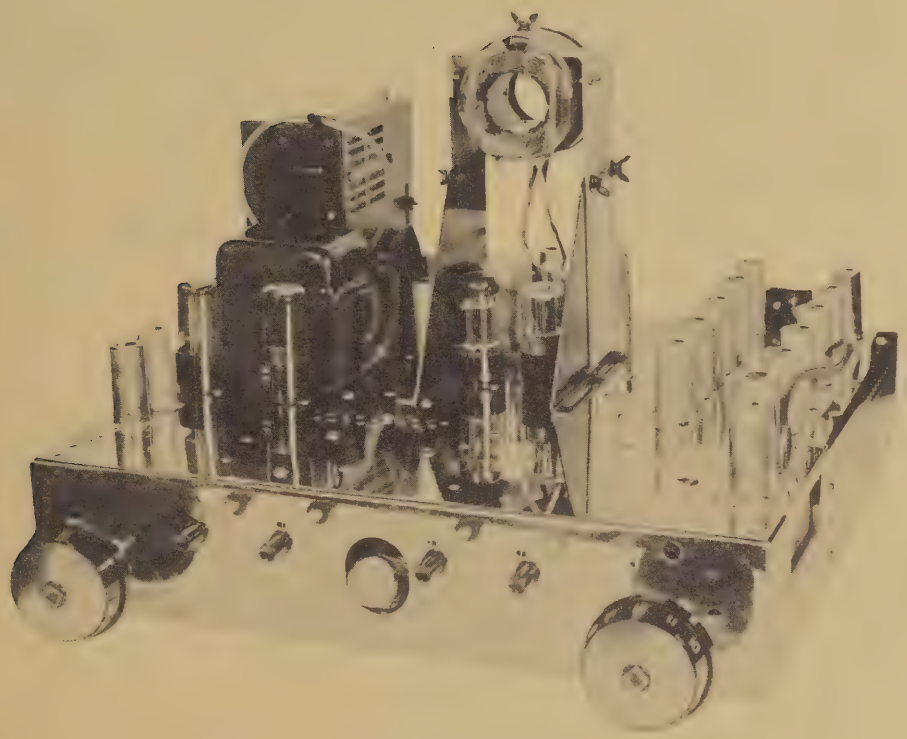

MODEL 202

RADIO CRAFTSMEN
MODEL 202

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

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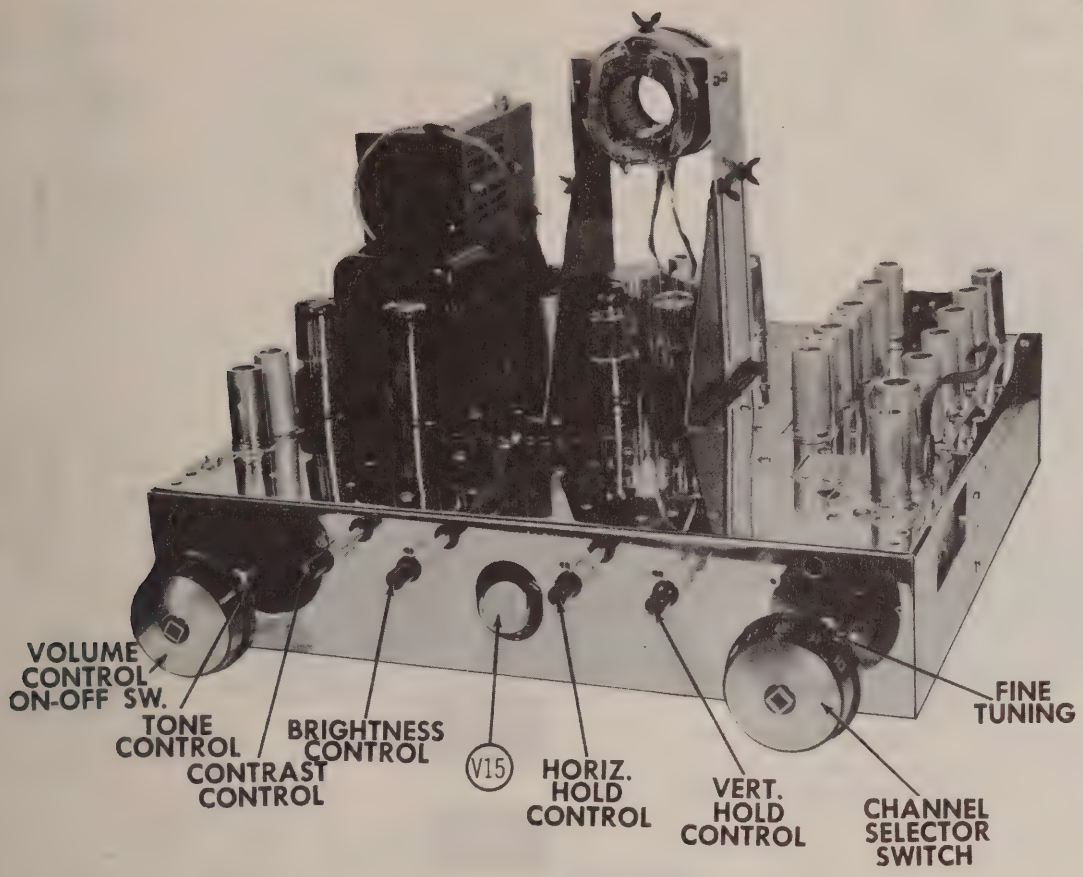

RADIO CRAFTSMEN
MODEL 202

TRADE NAME	Radio Craftsmen Model 202
MANUFACTURER	Radio Craftsmen Inc., 4401 N. Ravenswood Ave., Chicago 40, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-nine
POWER SUPPLY	110-120 volts AC-60 cycle
RATING	1.9 amp. @ 117 volts AC
TUNING RANGE-	Channels 2 thru 13

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HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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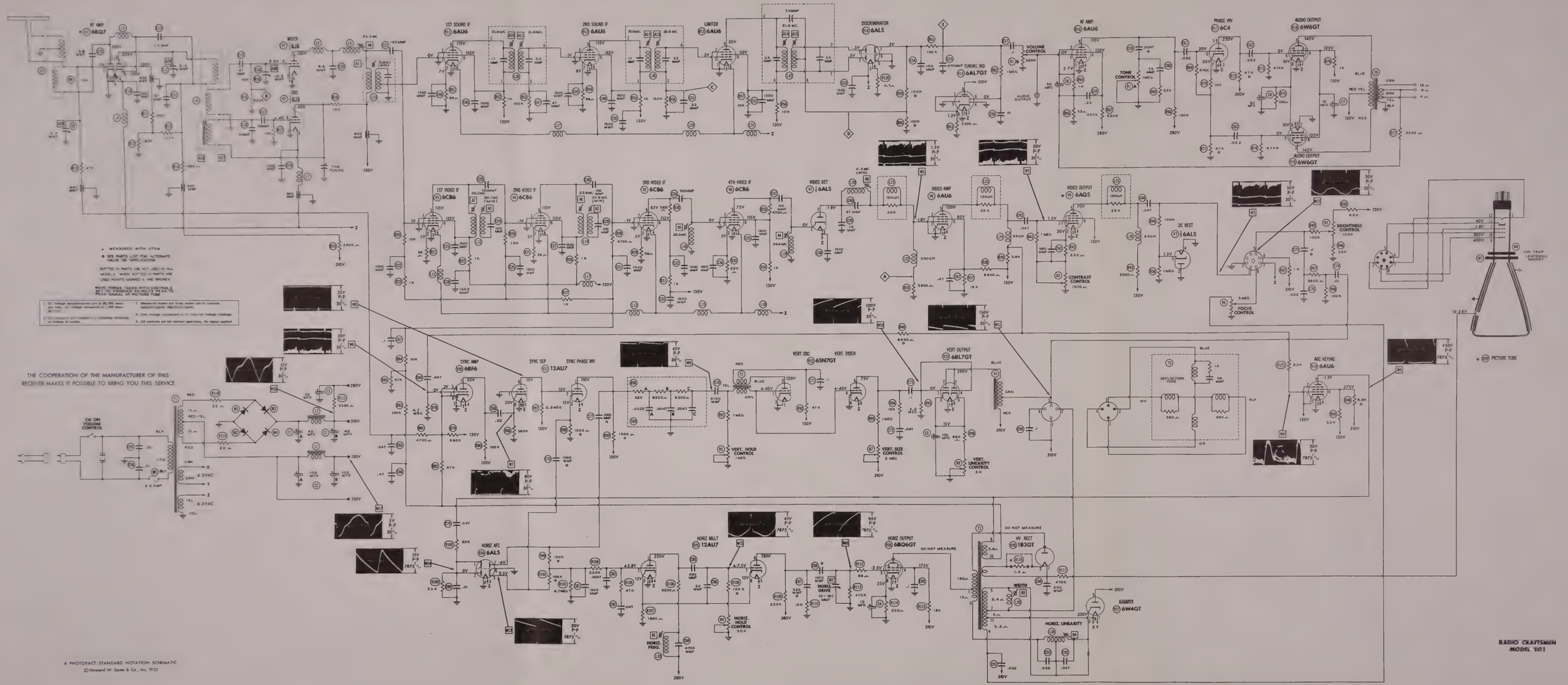
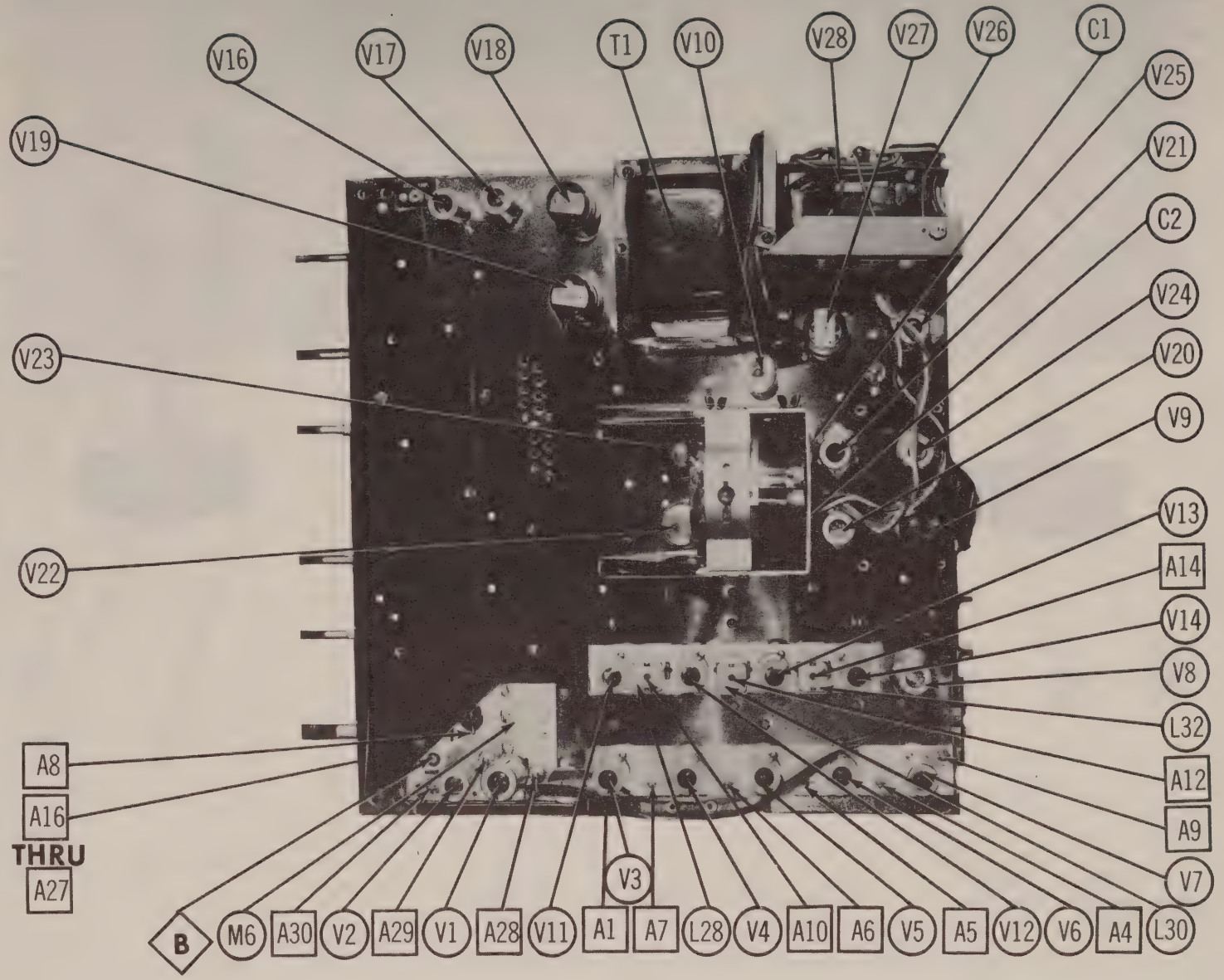
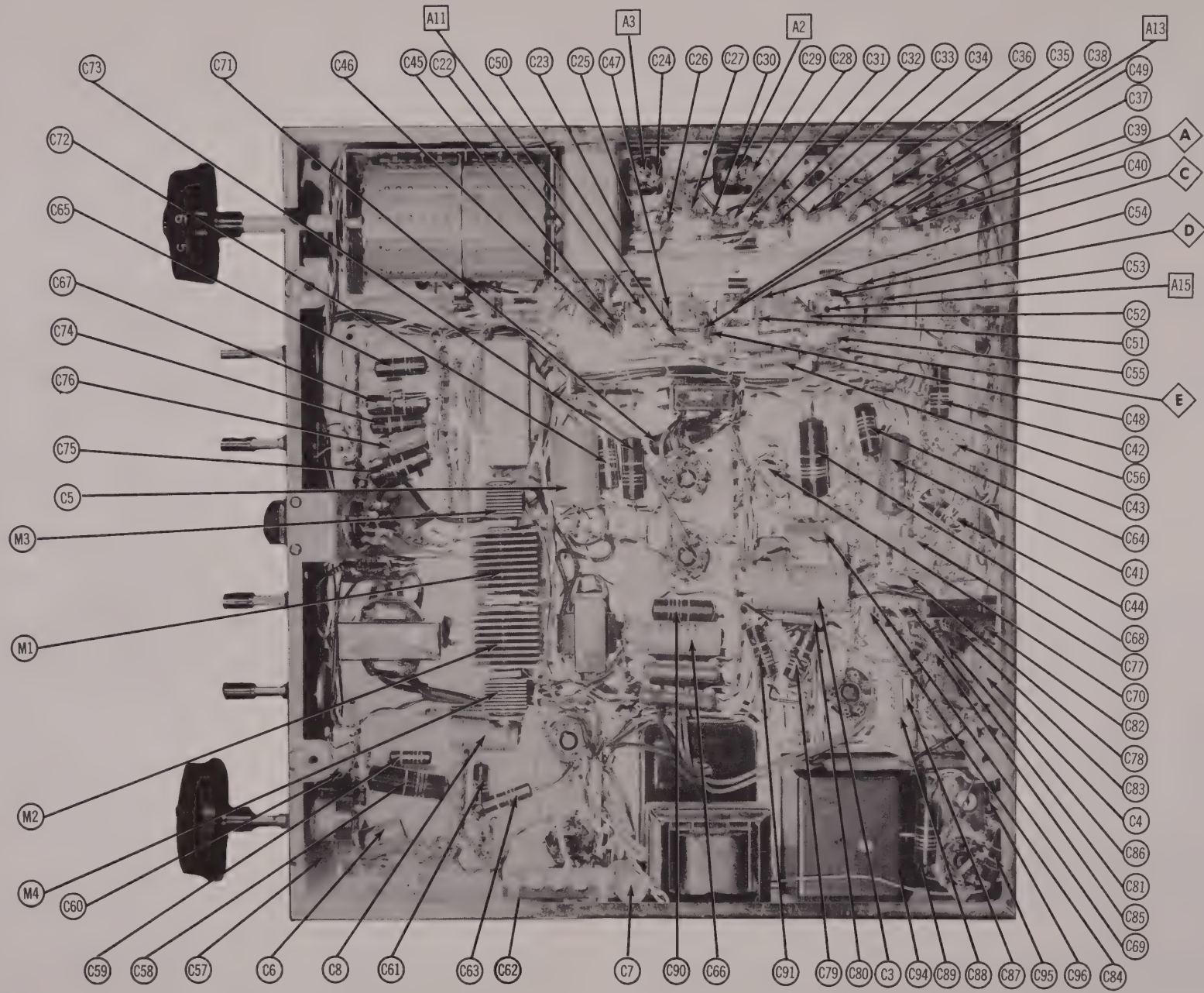
DATE 11-52 SET 184 FOLDER 13


RF AMP V1 6BQ7
MIXER V2 6J6
OSC V3 6J6
1ST SOUND IF V13 6AU6
2ND SOUND IF V14 6AU6
LIMITER V15 6AU6
DISCRIMINATOR V16 6AL5
TUNING IND V15 6AL7GT
VOLUME CONTROL
AF AMP V10 6AU6
TONE CONTROL
PHASE INV V17 6C4
AUDIO OUTPUT V18 6W6GT
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
4TH VIDEO IF V6 6CB6
VIDEO DET V7 1/2 6AL5
VIDEO AMP V8 6AU6
VIDEO OUTPUT V9 6AQ5
CONTRAST CONTROL
DC REST V7 1/2 6AL5
BRIGHTNESS CONTROL
FOCUS CONTROL
ION TRAP CENTERING MAGNET
V20 PICTURE TUBE
SYNC AMP V20 6BF6
SYNC SEP V21 12AU7
SYNC PHASE INV
VERT OSC V22 6SN7GT
VERT DISCH
VERT. HOLD CONTROL
VERT. SIZE CONTROL
VERT OUTPUT V23 6BL7GT
VERT. LINEARITY CONTROL
DEFLECTION YOKE
AGC KEYING V18 6AU6
HORIZ AFC V24 6AL5
HORIZ MULT V25 12AU7
HORIZ. FREQ.
HORIZ. HOLD CONTROL
HORIZ OUTPUT V26 6BQ6GT
HORIZ. DRIVE
HV RECT V28 1B3GT
WIDTH
HORIZ. LINEARITY
DAMPER V27 6W4GT
SW. ON VOLUME CONTROL
3.0 AMP
6.3VAC
6.3VAC
FINE TUNING
TUNING
AUDIO OUTPUT
DO NOT MEASURE
DO NOT MEASURE
▲ MEASURED WITH VTVM
SEE PARTS LIST FOR ALTERNATE TABLE TOP INSTALLATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 26,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Voltages measured with respect to chassis unless otherwise noted.
3. Measured values are from socket pin to chassis unless otherwise noted.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1952
RADIO CRAFTSMEN MODEL 202
RADIO CRAFTSMEN MODEL 202



CHASSIS TOP VIEW


A11
A3
A2
A13
C73
C71
C46
C45
C22
C50
C23
C25
C47
C24
C26
C27
C30
C29
C28
C31
C32
C33
C34
C36
C35
C38
C49
C37
C39
A
C40
C
C72
C54
D
C65
C53
A15
C67
C52
C74
C51
C76
C55
E
C48
C75
C42
C5
C56
C43
M3
C64
C41
C44
M1
C68
C77
C70
C82
C78
C83
M2
C4
C86
M4
C81
C60
C85
C69
C59
C58
C57
C6
C8
C61
C63
C62
C7
C90
C66
C91
C79
C80
C3
C94
C89
C88
C87
C95
C96
C84

TUBE PLACEMENT CHART

PROPERTY OF
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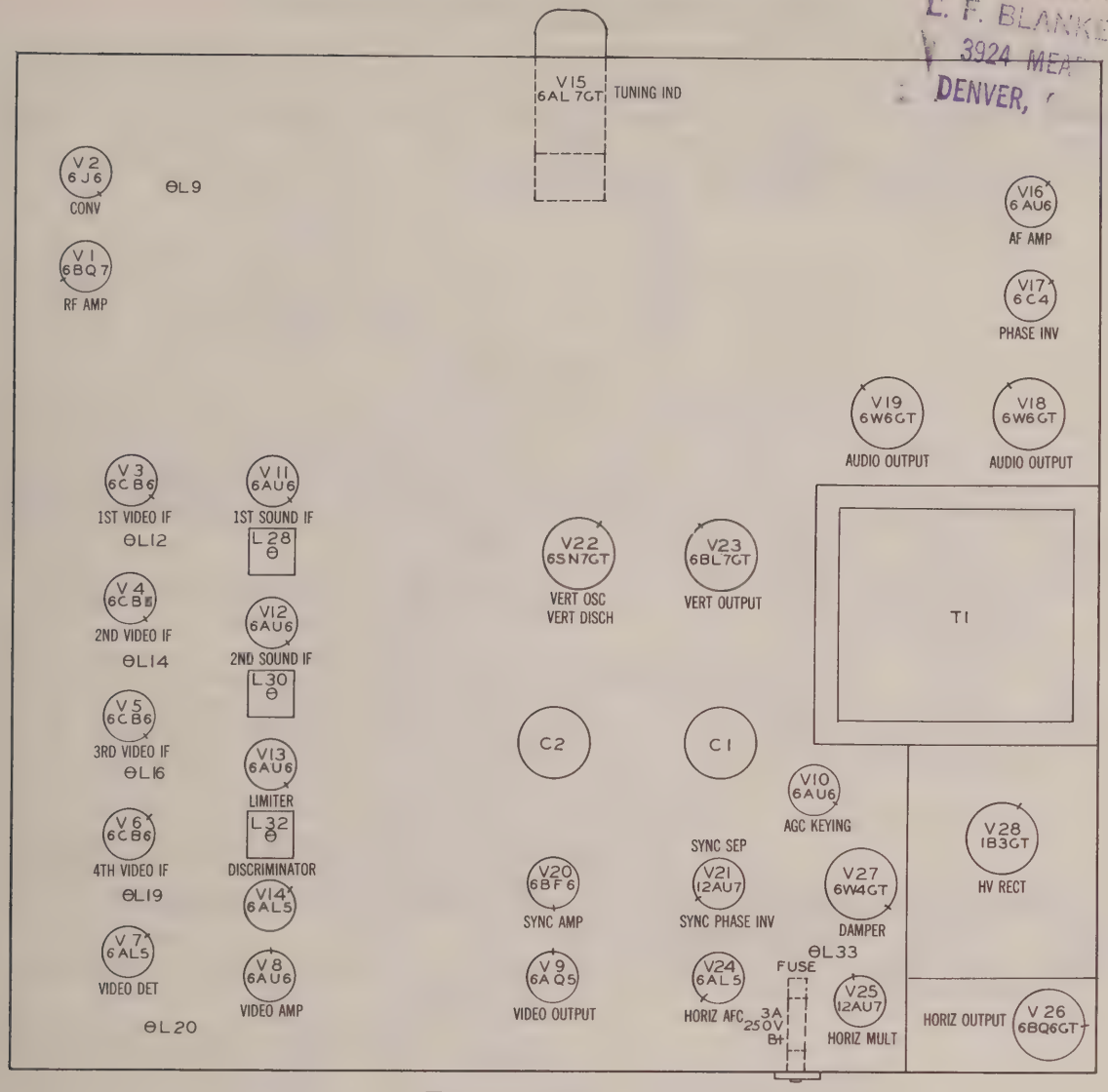
3924 MEA
DENVER,



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, No sound - Selenium Rectifiers (M1, M2, M3, M4), Fuse (M5)

LOSS OF PICTURE OR SOUND
No pic, No sound, has raster - V2
No pic, No sound, has snow - V1, V2
No pic, has sound, has raster - V3, V4, V5, V7, V8, V9, V29
Has pic, No sound - V11, V12, V13, V14, V16 , V18, V19
Overloaded picture - V10

SYNC FAILURE
No vert. sync - V21, V22
No horiz. sync - V21, V24, V25
No vert. or horiz. sync - V20, V21

SWEEP FAILURE
No raster, has sound- V25, V26, V27, V28, V29
No vertical deflection - V23
Poor vert. linearity or foldover - V22, V23
Poor horiz. linearity or foldover - V25, V26, V27
Narrow picture - V25, V26, V27, V28, M1, M2, M3, M4
Vert. off freq. - V21, V22
Horiz. off freq. - V21, V24, V25

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal multivibrator tube, V25.
Remove the AGC Keying Tube (V10) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 which has pin one removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt bias battery to the ungrounded side of C66. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	21.6MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1, A2	Adjust for MINIMUM deflection.
2.	"	"	20.1MC	"	"	A3	"
3.	"	"	24.4MC	"	"	A4	Adjust for maximum deflection.
4.	"	"	25.5MC	"	"	A5	"
5.	"	"	22.9MC	"	"	A6	"
6.	"	"	25.3MC	"	"	A7	"
7.	"	"	23.5MC	"	"	A8	"
8.	"	"	4.5MC	"	"	A9	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.6MC 26.1MC	Any	Vert. amp. to point (A). Low side to chassis.		Check for response similar to fig. 1 if necessary retouch A4 thru A8 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to point (B) Low side to chassis.	21.6MC (Unmod)	Any	DC probe to point (C) Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (D) Common to chassis.	A13, A14	"
12.	"	"	"	"	DC probe to point (E) Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450 KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to point (B) Low side to chassis.	21.6MC (450KC Swp)	21.6MC	Any	Vert. amp. thru 47KΩ to point (C) Low side to chassis.	A10, A11, A12	Adjust for curve of maximum amplitude and symmetry as if fig. 2
11.	"	"	"	"	"	Vert. amp thru 47KΩ to point (E) Low side to chassis.	A13, A14, A15	Adjust A15 so that 21.6MC occurs at center of crossover lines as per fig. 3. Adjust A13 and A14 for maximum amplitude and straightness of crossover lines. Continue with step 13.

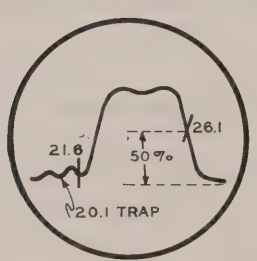


FIG.1

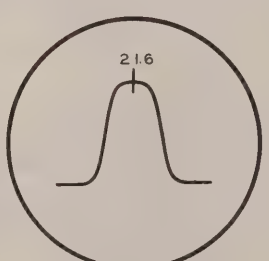


FIG. 2

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Use zero bias.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Remove dummy converter tube and replace original 6J6 in its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	215.75MC (Unmod.)	13	DC probe to point (E). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75MC	12		A17	
			203.75MC	11		A18	
			197.75MC	10		A19	
			191.75MC	9		A20	
			185.75MC	8		A21	
			179.75MC	7		A22	
			87.75MC	6		A23	
			81.75MC	5		A24	
			71.75MC	4		A25	
			65.75MC	3		A26	
			59.75MC	2		A27	

RF AND MIXER ALIGNMENT

Use zero bias.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. to point (B). Low side to chassis.	A28, A29 A30	Adjust for curve of maximum amplitude similar to fig. 4, with markers above 90%.
15.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to fig. 4. If markers fall below 70% on any channel make compromise adjustments of A28, A29, and A30 with channel selector switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

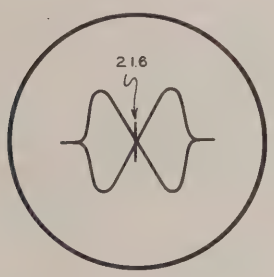


FIG. 3

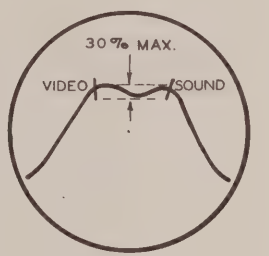
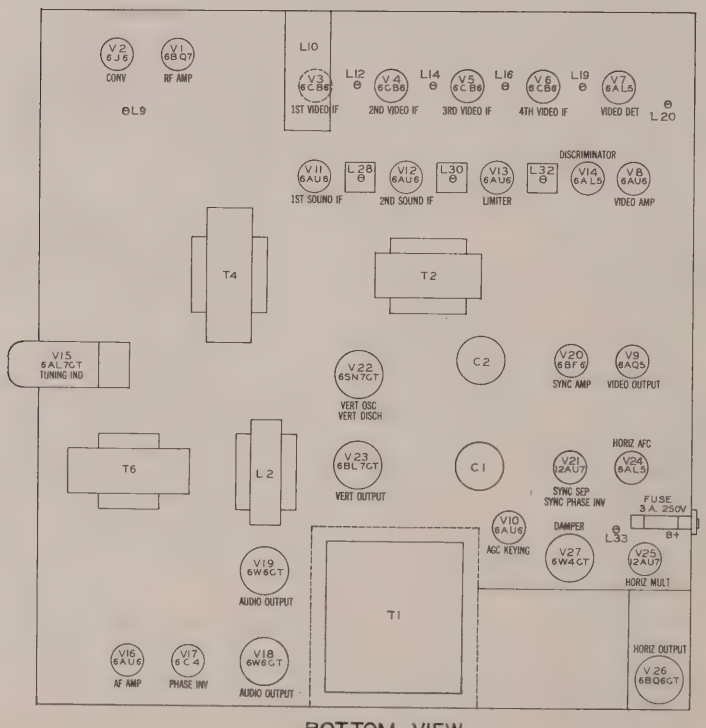


FIG. 4

RESISTANCE MEASUREMENTS

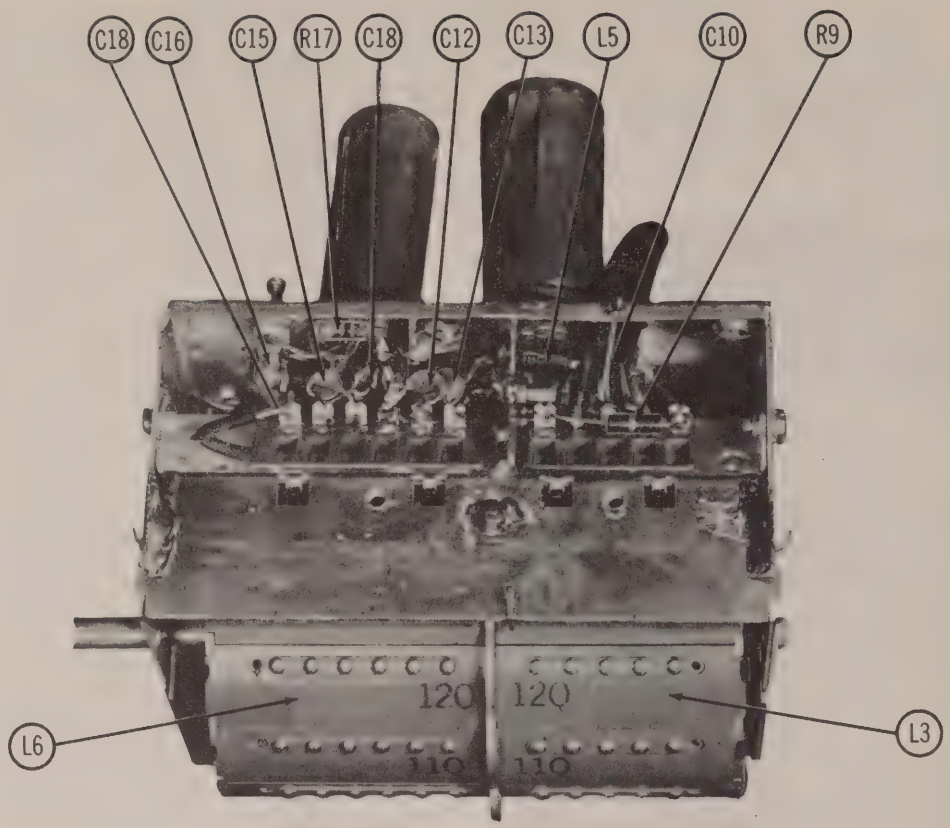
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	245KΩ	0Ω	.1Ω	0Ω	†5.4KΩ	†160KΩ	INF	0Ω
V 2	6J6	■10KΩ	■140Ω	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	69KΩ	56Ω	0Ω	.1Ω	■1.1KΩ	■1.1KΩ	0Ω		
V 4	6CB6	68KΩ	56Ω	0Ω	.1Ω	■1.1KΩ	■1.1KΩ	0Ω		
V 5	6CB6	61KΩ	56Ω	0Ω	.1Ω	■4.4KΩ	■1.1KΩ	0Ω		
V 6	6CB6	.1Ω	220Ω	.1Ω	0Ω	■5.8KΩ	■1.1KΩ	0Ω		
V 7	6AL5	.1Ω	0Ω	.1Ω	0Ω	1 Meg	0Ω	3.9KΩ		
V 8	6AU6	3.9KΩ	0Ω	0Ω	.1Ω	■4KΩ	■6.9KΩ	0Ω		
V 9	6AQ5	1 Meg	1.2KΩ	0Ω	.1Ω	■3.4KΩ	■140Ω	1 Meg		
V 10	6AU6	■37KΩ	■140Ω	0Ω	.1Ω	150KΩ	†5.6KΩ	■140Ω		
V 11	6AU6	.1Ω	0Ω	0Ω	.1Ω	■1.1KΩ	■1.1KΩ	68Ω		
V 12	6AU6	100KΩ	0Ω	0Ω	.1Ω	■1.1KΩ	■1.1KΩ	68Ω		
V 13	6AU6	150KΩ	0Ω	0Ω	.1Ω	■5.1KΩ	■5.1KΩ	0Ω		
V 14	6AL5	200KΩ	100KΩ	.1Ω	2.1Ω	0Ω	0Ω	100KΩ		
V 15	6AL7GT	3.3KΩ	.1Ω	†47Ω	0Ω	0Ω	1.3Meg	0Ω	3.3KΩ	
V 16	6AU6	40KΩ	1KΩ	0Ω	.1Ω	†100KΩ	†220KΩ	1KΩ		
V 17	6C4	†50KΩ	INF	.1Ω	0Ω	†50KΩ	517KΩ	57KΩ		
V 18	6W6GT	INF	.1Ω	■85Ω	■1.1KΩ	470KΩ	INF	0Ω	100Ω	
V 19	6W6GT	INF	.1Ω	■85Ω	■1.1KΩ	470KΩ	INF	0Ω	100Ω	
V 20	6BF6	4.7Meg	0Ω	0Ω	.1Ω	190KΩ	190KΩ	■100K		
V 21	12AU7	■1.6KΩ	■2.2Meg	1.5KΩ	.1Ω	.1Ω	■2.2Meg	0Ω	560KΩ	0Ω
V 22	6SN7GT	1.3Meg	■47KΩ	0Ω	1.3Meg	†2.5Meg	0Ω	0Ω	.1Ω	
V 23	6BL7GT	2.2Meg	†1.4KΩ	1KΩ	2.2Meg	†1.4KΩ	1KΩ	0Ω	.1Ω	
V 24	6AL5	33KΩ	33KΩ	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V 25	12AU7	†11KΩ	4.9Meg	1.8KΩ	.1Ω	.1Ω	†220KΩ	130KΩ	1.8KΩ	0Ω
V 26	6BQ6GT	INF	0Ω	INF	†18KΩ	470KΩ	470KΩ	.1Ω	220Ω	TopCap #18Ω
V 27	6W4GT	INF	INF	5 Meg	INF	†47Ω	INF	#12Ω	#12Ω	
V 28	1B3GT	PINS 1-8 HAVE INF RESISTANCE								TopCap #198Ω
V 29	17HP4	0Ω	1.1Meg	Pin 6 #1Meg	Pin 10 †1KΩ	Pin 11 150KΩ	Pin 12 .1Ω			

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM OUTPUT OF M3 & M4
■ MEASURED FROM 150VDC LINE

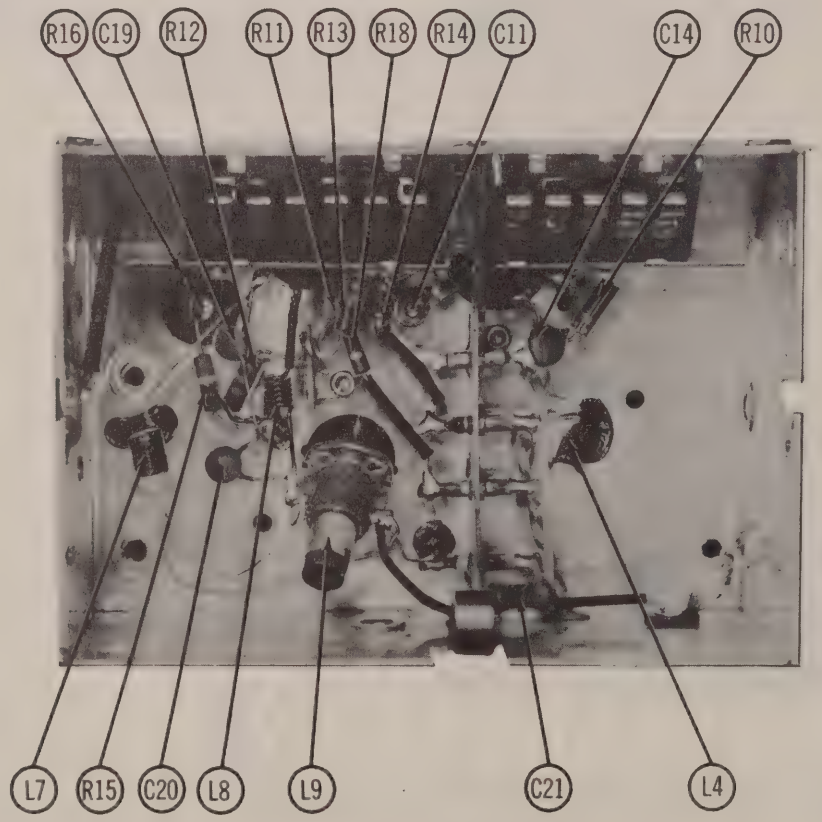


BOTTOM VIEW

TUBE PLACEMENT CHART

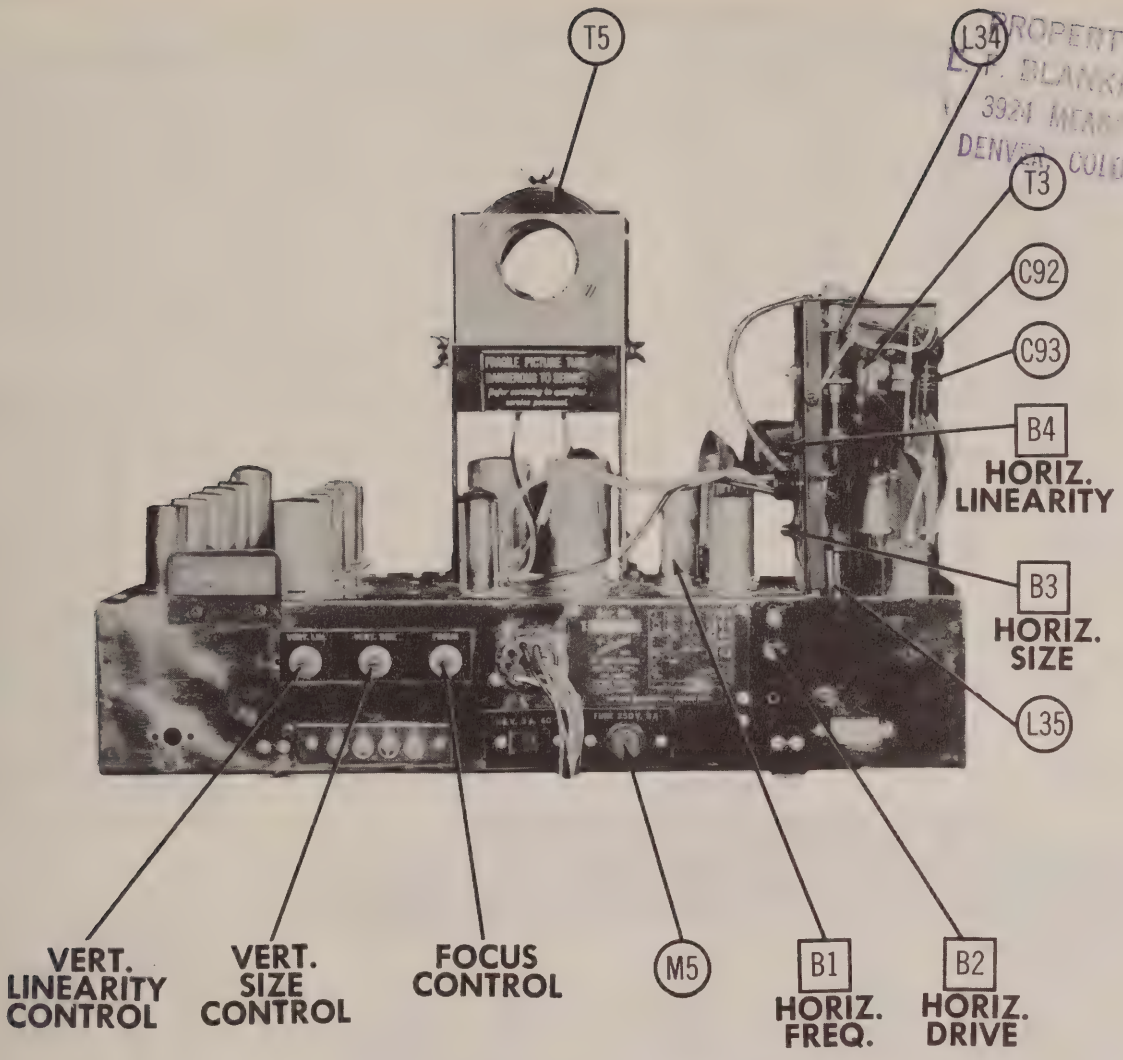


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the center of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) in a maximum counter clockwise direction without a vertical white line or compression in the center of the picture.

Adjust the horizontal size slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Radio Craftsmen PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6BQ7	6BQ7	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector	6AL5	6AL5	7BT	
V8	Video Amplifier	6AU6	6AU6	7BK	
V9A	Video Output	6AQ5	6AQ5	7BZ	
B	Video Output	6AR5	6AR5	6CC	
V10	AGC Keying	6AU6	6AU6	7BF	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V13	Limiter	6AU6	6AU6	7BK	
V14	Discriminator	6AL5	6AL5	6BT	
V15	Tuning Indicator	6AL7GT	6AL7GT	8CH	
V16	AF Amplifier	6AU6	6AU6	7BK	
V17	Phase Inverter	6C4	6C4	6BG	
V18	Audio Output	6W6GT	6W6GT	7AC	
V19	Audio Output	6W6GT	6W6GT	7AC	
V20	Sync Amplifier	6BF6	6BF6	7BT	
V21	Sync Separator Sync Phase Inv.	12AU7	12AU7	9A	
V22	Vert. Oscillator Vert. Discharge	6SN7GT	6SN7GT	8BD	
V23	Vert. Output	6BL7GT	6BL7GT	8BD	
V24	Horiz. AFC	6AL5	6AL5	6BT	
V25	Horiz. Mult.	12AU7	12AU7	9A	
V26	Horiz. Output	6BQ6GT	6BQ6GT	8AM	
V27	Damper	6W4GT	6W4GT	4CG	
V28	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Radio Craftsmen PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RMA BASE TYPE	NOTES
V29A	17HP4	17HP4	12C	① Circuit changes necessary
B	21FP4	17RP4	12C	
C	24BP4	21FP4	12C	
		21FP4A ①	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Radio Craftsmen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	400	18S010	AFH2-57		UPT4445		FP238	TVL-2764	
B	▲40	400								
C2A	▲100	200	18S011	[illegible]		UPE101020		FP217.7	TVL-2535	
B	▲100	200								
C3	20	400	18X030	PRS450/20		BR2045A		TC75	TVA-1709	
C4	10	50	18X029	PRS50/10		[illegible]		TC32	TVA-1304	
C5	100	50	18S013	PRS50/100		BR1501		TC3501	TVA-1310	
C6	50	25	18S007	PRS25/50		BR502A		TC29	TVA-1206	
C7	10	150	18X031	PRS150/12		BR1015		TC42	TVA-1406	
C8	50	25	18S007	PRS25/50		BR502A		TC29	TVA-1206	
C9	3-9				829-10					
C10	3.6									
C11	.5-3				829-3			CT565A		
C12	47		CC20UK470M	SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C13	1.5		CC20SL1R5M	SI5.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C14	1000		CC20SL102M	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C15	47		CC20VK470M	SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C16	5-3				829-3			CT565A		
C17	10		CC20SL100M	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C18	5		CC20SL5R0M	SI5NT50	TCN-5		N750K-050	NT-555	5TCU-V5	
C19	1000		CC20SL102M	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C20	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C21	130		CC20SL121M	SI130	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C22	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C23	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C24	100		CM10A101K	[illegible]		5R5T1		MCB235	MS-31	
C25	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C26	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C27	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C28	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C29	100	500	CM10A101K	[illegible]		5R5T1		MCB235	MS-31	
C30	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C31	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C32	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C33	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C34	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C35	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C36	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C37	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C38	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C39	10		CC20SL100M	SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C40	47	500	CM15A470M	1469-00005		5R5Q5		MCB225	MS-45	
C41	.47	200	CP10M2474M	P288-47				PT405	2TM-P47	
C42	.047	400	CP10M4473M	P488-047	DF-503	PTE4S47		PT6147	4TM-S47	
C43	560	500	CM20A561K							
C44	.047	400	CP10M4473M	P488-047	DF-503	PTE4S47		PT6147	4TM-S47	
C45	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C46	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C47	47		CC20UK470M	SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C48	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C49	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C50	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C51	22		CC20SL220M	SI22	D6-220	5W5T25	GP1K-220	UC-5422	5GA-Q22	
C52	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C53	1500		18X705	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Radio Craftsmen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	100		CC20SL101M	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C55	470		CC25SL471K	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C56	.01	400	CP10M4103M	P486-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C57	.1	400	CP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C58	.22	400	CP10M4224M	P488-22		PTE4P22		PT4025	4TM-P22	
C59	.0047	600	CP10M4472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	Note 1
C60	75	500	CM20A750M	1468-000075	D6-750		GP1K-750	MC230	1FM-475	
C61	.022	400	CP10M4223M	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C62	.022	400	CP10M4223M	P488-023	DF-203	PTE4S22		PT4122	4TM-S22	
C63	.022	400	CP10M4223M	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C64	.047	400	CP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C65	.047	400	CP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C66	.47	200	CP10M2474M	P288-47		PJF247		PT405	2TM-P47	
C67	.1	400	CP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	Note 2
C68	.22	400	CP10M4224M	P488- 22		PTE4P22		PT4025	4TM-P22	Note 3
C69A	.0022			P688-0022	D6-222	PTE6D22		PT6222		
B	.0047		●18X706	P688-0047	D6-472	PTE6D47	●1405-01	PT6247	●101C1	
C	.0047			P688-0047	D6-472	PTE6D47		PT6247		
C70	4700	500	CP10M4472M	1464-005		1DR5D5		MCB465	MS-25	
C71	.1	400	CP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C72	.047	400	CP10M4473M	P488-047		PTE4S47		PT4147	4TM-S47	
C73	.1	400	CP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C74	.01	600	CP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C75	.1	400	CP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	Note 2
C76	.022	400	CP10M4223 M	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C77	1000	500	CM25A102M	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C78	1000	500	CM25A102M	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C79	.047	400	CP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C80	.01	600	CP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C81	1500	500	CM20A152K	1467-0015	D6-152	1W5D15	GP2L-152	MC256	1FM-215	
C82	.047	400	CP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C83	.0047	600	CP10M4472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C84	4700	500	CM30A472K	1464-005		1DR5D5		MCB465	MS-25	
C85	390	500	CM20A391K	1469-0004		5R5T4		MCB243	MS-34	
C86	22	500	CM15A220M	1468-000025	D6-220	5W5T25	GP1K-220	MC220	1FM-425	
C87	330	500	CM20A331K	1469-00035						Note 3
C88	1000	500	CM25A102M	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	Note 3
C89	.1	400	CP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C90	.1	400	CP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C91	.022	400	CP10M4223M	P488-022		PTE4S22		PT4122	4TM-S22	
C92	.047	400	CP10M4473M	P488-047		PTE4S47		PT4147	4TM-S47	
C93	.056	400	CP10M4563M							
C94	500	20000	18X613		HV20C	TV3-501	MMC-20T5	413-501	20DK-T5	
C95	.01	600	CP10M6103M	689ZGXY-01			P26S1		PT611	6TM-S1
C96	.01	600	CP10M6103M	689ZGXY-01			P26S1		PT611	6TM-S1

Note 1. Some Models use .047MFD in this application.
Note 2. Some Models use .01MFD in this application.
Note 3. Some Models use 470MMF in this application.

● Items C69A, C69B, C69C, R90A, R90B, R90C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Radio Craftsmen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2 Meg		23S718	QJ-182 *	RTV-153		UR16A	Tone-Panel
B	500K						UR55A	Volume-Rear
C	Switch						US-26	Attach to R1B
R2A	1500Ω	2	23S805	WK-1500	A43-1500	V-130	R1500L	Contrast-Wire Wound
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	D8-36	Attach to R2A
R3A	100KΩ		23S719	QU-138	AG-49-8	B-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	50KΩ		23S720	QU-123	AG-44-8	B-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R4A
R5A	1 Meg		23S721	QU-137	AG-61-8	B-89	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R5A
R6A	5 Meg		23S722	QU-141	AG-85-8	AB-87	SU-67	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	2 Meg		23S723	QU-139	AG-83-8	AB-75	SU-56	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	5000Ω		23S724	QU-114	AG-19-8	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B13-137 & P1-114 (Panel), B13-133 & R1-202 (Rear) & SWITCH 76-1

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Radio Craftsmen PART No.	IRC PART No.	NOTES
R9	15KΩ		RC20AE153K	BTS-15K	
R10	47KΩ		RC20AE473K	BTS-47K	
R11	100KΩ-5%		RC20AE104K	BTS-100K-5%	
R12	160KΩ-5%		RC20AE164K		
R13	100KΩ		RC20AE104K		
R14	1500Ω		RC20AE152K	BTS-1500	
R15	220KΩ		RC20AE224K	BTS-220K	
R16	10KΩ		RC20AE103K	BTS-10K	
R17	10KΩ		RC20AE103K	BTS-10K	
R18	10KΩ		RC20AE103K	BTS-10K	
R19	3900Ω		RC30AE392K	BTA-3900	
R20	10KΩ		RC20AE103K		
R21	[illegible]		RC20AE560K		
R22	1000Ω		RC20AE102K	BTS-1000	
R23	1000Ω		RC20AE102K	BTS-1000	
R24	10KΩ		RC20AE103K		
R25	56Ω		RC20AE560K		
R26	1000Ω		RC20AE102K	BTS-1000	
R27	1000Ω		RC20AE102K	BTS-1000	
R28	4700Ω		RC20AE472K		
R29	56Ω		RC20AE560K		
R30	3300Ω		RC20AE332K	BTS-3300	
R31	1000Ω		RC20AE102K	BTS-1000	
R32	220Ω		RC20AE221K	BTS-220Ω	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Radio Craftsmen PART No.	IRC PART No.	NOTES
R33	4700Ω		RC20AE472K	BTS-4700	
R34	1000Ω		RC20AE102K	BTS-1000	
R35	3900Ω		RC30AE392K	BTS-3900	
R36	1 Meg		RC20AE105K	BTS-1 Meg	
R37	15KΩ		RC30AE153K	BTA-15K	
R38	6800Ω		RC30AE682K	BTA-6800	
R39	3900Ω		RC20AE392K	BTS-3900	
R40	6800Ω		RC20AE682K	BTS-6800	Note 1
R41	1 Meg		RC20AE105K	BTS-1 Meg	
R42	220 Ω		RC20AE221K	BTS-220	
R43	3300Ω		RC40AE332K	BTB-3300	
R44	100KΩ		RC20AE104K	BTS-100K	
R45	100KΩ		RC20AE104K	BTS-100K	
R46	33KΩ		RC20AE333K	BTS-33K	
R47	1000Ω		RC20AE102K	BTS-1000	
R48	6800Ω		RC20AE682K	BTS-6800	Note 2
R49	33KΩ		RC30AE333K	BTA-33K	
R50	68KΩ		RC20AE683K	BTS-68K	
R51	68Ω		RC20AE680K		
R52	1000Ω		RC20AE102K	BTS-1000	
R53	100KΩ		RC20AE104K	BTS-100K	
R54	68Ω		RC20AE680K		
R55	1000Ω		RC20AE102K	BTS-1000	
R56	150KΩ		RC20AE154K	BTS-150K	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Radio Craftsmen PART No.	IRC PART No.	NOTES
R57	10KΩ	1	RC30AE103K	BTA-10K	
R58	10KΩ	1	RC30AE103K	BTA-10K	
R59	100KΩ	½	RC20AE104K	BTS-100K	Note 5
R60	100KΩ	½	RC20AE104K	BTS-100K	Note 5
R61	150KΩ	½	RC20AE154K	BTS-150K	
R62	1 Meg	½	RC20AE105K	BTS-1 Meg	
R63	3300Ω	½	RC20AE332K	BTS-3300	
R64	1000Ω	½	RC20AE102K	BTS-1000	
R65	33Ω	½	RC20AE330K		
R66	100KΩ	½	RC20AE104K	BTS-100K	
R67	220KΩ	½	RC20AE224K	BTS-220K	
R68	22KΩ	½	RC20AE223K	BTS-22K	
R69	470KΩ	½	RC20AE474K	BTS-470K	
R70	10KΩ	½	RC20AE103K	BTS-10K	
R71	47KΩ	½	RC20AE473K	BTS-47K	Note 6
R72	47KΩ	½	RC20AE473K	BTS-47K	Note 6
R73	470KΩ	½	RC20AE474K	BTS-470K	
R74	470KΩ	½	RC20AE474K	BTS-470K	
R75	100Ω	2	RC40AE101K	BW-2-100	
R76	1000Ω	1	RC30AE102K	BTA-1000	
R77	3300Ω	½	RC20AE332K	BTS-3300	
R78	4.7Meg	½	RC20AE475K	BTS-4.7Meg	
R79	680KΩ	½	RC20AE684K	BTS-680K	
R80	100KΩ	½	RC20AE104K	BTS-100K	
R81	4700Ω	½	RC20AE472K	BTS-4700	
R82	47KΩ	½	RC20AE473K	BTS-47K	
R83	100KΩ	½	RC20AE104K	BTS-100K	
R84	10KΩ	½	RC20AE103K	BTS-10K	
R85	47KΩ	½	RC20AE473K	BTS-47K	
R86	560KΩ	½	RC20AE564K	BTS-560K	
R87	2.2Meg	½	RC20AE225K	BTS-2.2Meg	
R88	1500Ω	½	RC20AE152K	BTS-1500	Note 7
R89	1500Ω	½	RC20AE152K	BTS-1500	Note 7

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Radio Craftsmen PART No.	IRC PART No.	NOTES
R90A	22KΩ	½	●18X706	BTS-22K	
B	8200Ω	½	●	BTS-8200	Note 8
C	8200Ω	½	●	BTS-8200	Note 8
R91	1 Meg	½	RC20AE105K	BTS-1 Meg	
R92	475Ω	½	RC20AE473K	BTS-47K	
R93	1 Meg	½	RC20AE105K	BTS-1 Meg	
R94	12KΩ-5%	½	RC20AE123J	BTS-12K-5%	
R95	2.2Meg	½	RC20AE225K	BTS-2.2Meg	
R96	680Ω	½	RC20AE681K	BTS-680	
R97	5600Ω	½	RC20AE562K	BTS-5600	
R98	100KΩ	½	RC20AE104K	BTS-100K	
R99	100KΩ	½	RC20AE104K	BTS-100K	Note 8
R100	100KΩ	½	RC20AE104K	BTS-100K	Note 8
R101	4.7Meg	½	RC20AE475K	BTS-4.7Meg	
R102	22KΩ	1	RC20AE223K	BTA-22K	
R103	33KΩ	½	RC20AE333K	BTS-33K	
R104	220KΩ	½	RC20AE224K	BTS-220K	
R105	47KΩ	½	RC20AE473K	BTS-47K	
R106	8200Ω	½	RC20AE823K	BTS-8200	
R107	1800Ω	½	RC20AE182J	BTS-1800	
R108	100KΩ	½	RC20AE104K	BTS-100K	Note 3
R109	220KΩ	½	RC20AE224K	BTS-220K	
R110	10KΩ	½	RC20AE103K	BTS-10K	
R111	3300Ω	1	RC30AE332K	BTA-3300	
R112	68Ω	½	RC20AE680K		
R113	470KΩ	½	RC20AE474K	BTS-470K	
R114	220Ω	5	RW5221K	1 3/4A-225	
R115	18KΩ	5	RW5183K	1 3/4A-18K	
R116	1.5Ω	1			Note 4
R117	470KΩ	½	RC20AE474K		
R118	22Ω	5	RW5220K		
R119	22Ω	5	RW5220K		
R120	4.7Ω	5	RW04R7K		
R121	33KΩ	½	RC20AE333K	BTS-33K	

Note 1 Some models use a 15KΩ resistor in this application.
Note 2 Some models use 10KΩ resistor in this application.
Note 3 Some models use a 82KΩ resistor in this application.
Note 4 Not used in all models.
Note 5 R59 & R60 are matched within ±5% tolerance.
Note 6 R71 & R72 are matched within ±5% tolerance.
Note 7 R88 & R89 are matched within ±5% tolerance.
Note 8 R99 & R100 are matched within ±5% tolerance.
● Items R90A, R90B, R90C, C69A, C69B, C69C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Radio Craftsmen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC	300VCT	6.3VAC	6.3VAC	19S210A				
	② 1.9A	.150ADC	1.2A	10.4A					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: Radio Craftsmen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	220Ω	1400Ω	19S601	A-8125	A-3000 ①	TBO-3 ①	A-97X	Vert. Osc. Trans.
T3	193Ω tap	10.6Ω tap	19S016					Horiz. Output Trans.
	② 13Ω	② 3.2Ω, 8.2Ω						
		SEC. 2 5Ω						
		SEC. 3 0Ω						
T4	1400Dtap		19S013	A-8123 ①	A-3038		A-102X ①	Vert. Output Trans.
	② 12Ω							
T5A	17Ω		5X813	DY-9A	MDF-70	TY-3	Y-17	Horiz. Deflection Coils
B	53Ω							Vert. Deflection Coils

① Drill one new mtg. hole

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Radio Craftsmen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	2.6KΩ CT	16Ω tap ② 8Ω, 4Ω	170Ω CT	1Ω tap ② .7Ω, .5Ω	19S011	A-3870	A-2904 ①			① Drill one new mtg. hole

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: Radio Craftsmen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.150	140Ω	5.5HY	19S408				
L2	.150	47.5Ω	1.4HY	19S407	C-2326 ①	C-2994 ①	TR-1515 ①	

① Drill one new mtg. hole.

RADIO CRAFTSMEN MODEL 202

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Radio Craftsmen PART No.	MERIT PART No.	
L3	Ant. Coils	0Ω				
L4	Fil. Choke	0Ω				
L5	Neutralizing Coil	0Ω				
L6	RF, Mixer Grid & Osc. Coils	0Ω				
L7	Fil. Choke	0Ω				
L8	RF Choke	0Ω				
L9	Conv. Plate	1.3Ω				
L10	1st. Video IF & Sound Take-off	1.2Ω				
L11	Fil. Choke	0Ω		5A406		.5 Microhenry
L12	2nd. Video IF	.1Ω		5A010		Includes Trap
L13	Fil. Choke	0Ω		5A406		.5 Microhenry
L14	3rd. Video IF	.1Ω		5A011		Includes Trap
L15	Fil. Choke	0Ω		5A406		.5 Microhenry
L16	4th. Video IF	.1Ω		5A012B	TV-102	
L17	RF Choke	0Ω		5A406		.5 Microhenry
L18	Fil. Choke	0Ω		5A406		.5 Microhenry
L19	5th. Video IF	.1Ω		5A012A	TV-102	
L20	4.5MC Trap	4Ω		5A407A	TV-151	
L21	Series Peaking Coil	4.2Ω		5X404	TV-182	120 Microhenries wound on 22KΩ resistor
L22	Shunt Peaking Coil	6.3Ω		5X405	TV-185	250 Microhenries
L23	Series Peaking Coil	4.2Ω		5X404	TV-182	120 Microhenries wound on 22KΩ resistor
L24	Shunt Peaking Coil	3.6Ω		5X403	TV-181	93 Microhenries
L25	Series Peaking Coil	4.2Ω		5X404	TV-182	120 Microhenries wound on 22KΩ resistor
L26	Shunt Peaking Coil	3.6Ω		5X403	TV-181	93 Microhenries
L27	Fil. Choke	0Ω		5A406		.5 Microhenry
L28	1st. Sound IF	.2Ω	.2Ω	5X018	TV-104	
L29	Fil. Choke	0Ω		5A406		.5 Microhenry
L30	2nd. Sound IF	.2Ω	.2Ω	5X018	TV-104	
L31	Fil. Choke	0Ω		5A406		.5 Microhenry
L32	Discriminator	.2Ω	.2Ω CT	5X007		
L33	Horiz. Osc.	50Ω		5S812	TV-163	
L34	Horiz. Lin.	5.5Ω		5S814		Tap @ 1.5Ω
L35	Width Coil	30Ω		5S815	MWC-1	

SELENIUM RECTIFIER

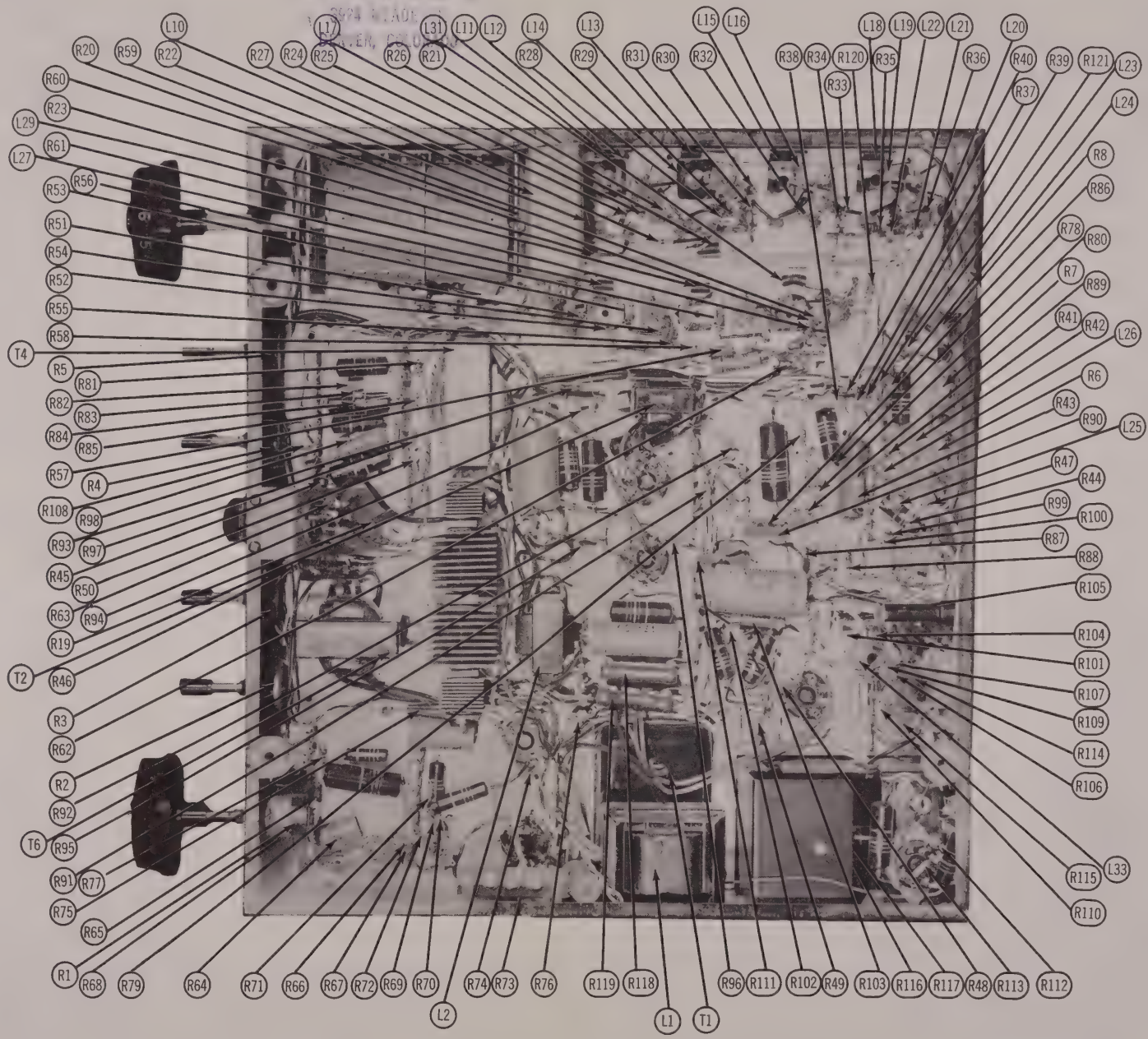
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	Radio Craftsmen PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.180A		NE5	5R1		6S200	
M2	.180A		NE5	5R1		6S200	
M3	.071A		NB5	5M4		6S75	
M4	.071A		NB5	5M4		6S75	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Radio Craftsmen PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M5	AGC	3A 250V			312003	341001	AGC-3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Radio Craftsmen PART No.	NOTES
M6	RF Tuner	25B050	
M7	Centering Magnet	16X408	
M8	Ion Trap	16X407	
B2	Trimmer	17X205	Horiz. Drive (10-160MMF)
	Knob	6X010	Contrast, Brightness , Horiz. & Vert. Hold (4 Used)
	Knob	6S011A	Off/On Volume
	Knob	6S011C	Channel Selector
	Knob	6S013A	Tone
	Knob	6S013C	Fine Tuning
	Panel Name Plate	3S802	



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
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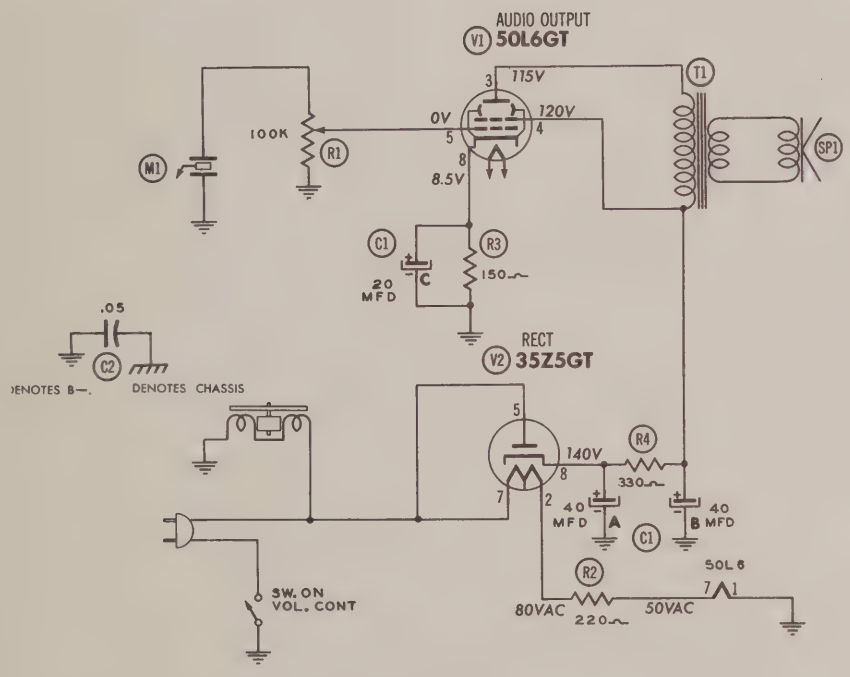
DENVER, COLORADO

STEELMAN
MODEL 102

TRADE NAME	Steelman Model 102
MANUFACTURER	Steelman Radio & Phono Co., Inc. 12-30 Anderson Ave., Mt Vernon, N.Y.
TYPE SET	AC Operated Two Tube Audio Amplifier With 3 Speed Manual Record Player
TUBES (TWO)	Types 50L6GT or 50A5 or 50C5 Audio Output, 35Z5GT or 35Y4 or 35W4Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .25 Amp. @ 117 Volts AC



Pin No.	50L6GT Res.	35Z5GT Res.
1	INF	INF
2	0Ω	270Ω
3	†498Ω	287Ω
4	†330Ω	INF
5	0Ω	305Ω
6	INF	†330Ω
7	50Ω	305Ω
8	150Ω	30KΩ

† MEASURED FROM PIN 8 OF V2.

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184—14

STEELMAN
MODEL 102

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	Audio Output	50L6GT	50L6GT	7AC	
B	Audio Output	50A5	50A5	6AA	
C	Audio Output	50C5	50C5	7CV	
V2A	Rectifier	35Z5GT	35Z5GT	6AD	
B	Rectifier	35Y4	35Y4	5AL	
C	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/50-30-20		EDL44215		3N532	TVA-3430	Red
B	40	150								Blue
C	20	150								Yellow
C2	.05	400		P488-05	DF-503	PTE485		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	VC1005	Q13-133	AG-60-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	220Ω	10		1 3/4A-225	
R3	150Ω	½		BTS-150	
R4	330Ω	1		BTA-330	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: STEELMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2KΩ	2.6Ω	168Ω	.42Ω	P-70-D	A-3332 ①	A-2928 ①	RO-2 ①	S-2X ①	① Bend mtg tabs down file out slots, mount on original mtg. bracket.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	2.6Ω	SP-45	ST-113 Mod. P4-X	4A07	

PHONO CARTRIDGE

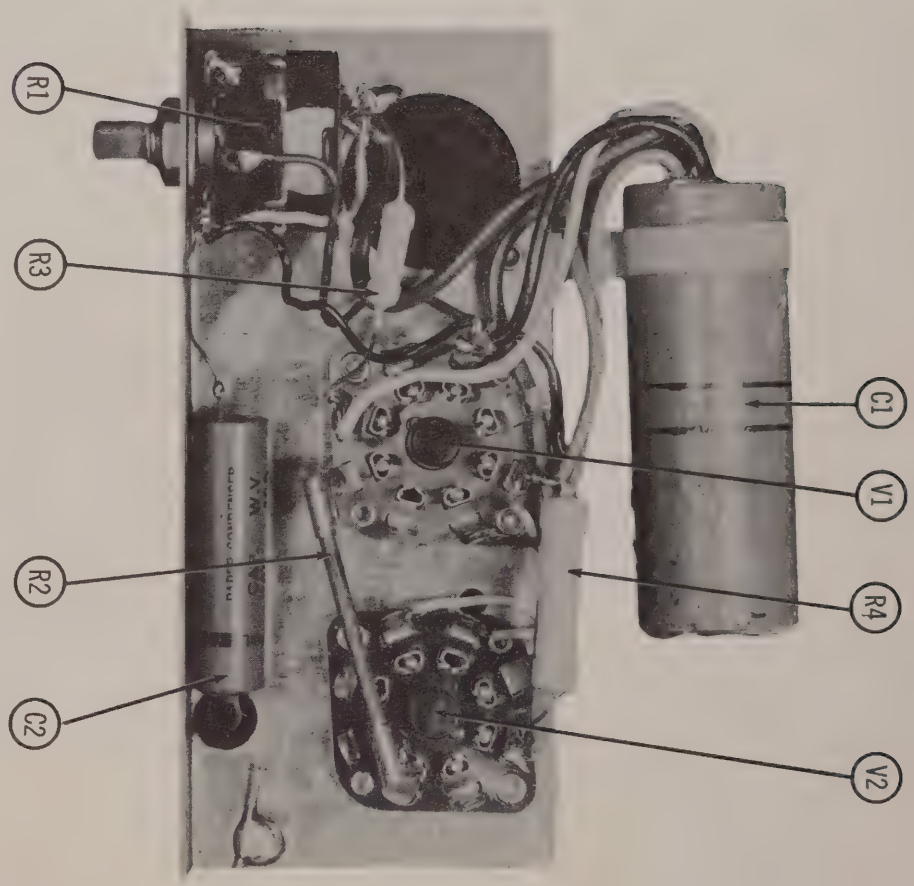
ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	SHURE PART No.: CARTRIDGE	SHURE PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1		L-29				H-60		

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	WALCO PART No.	JENSEN PART No.	REMARKS
M2			J-752 or J-152	

CHASSIS—BOTTOM VIEW



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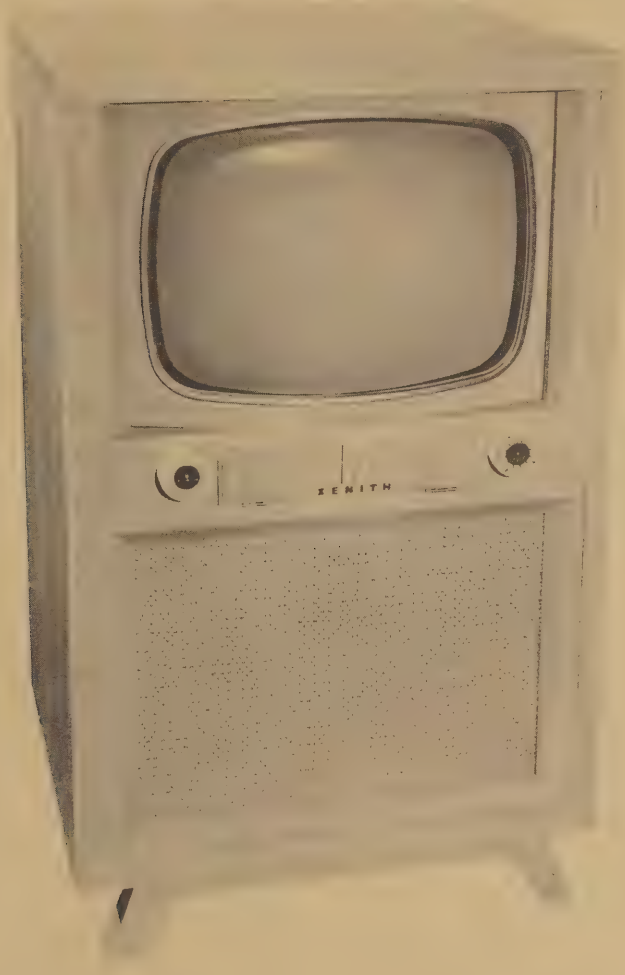

MODEL K1850E

ZENITH MODELS K1812E, R (Ch. 19K22), K1815E, R, K1820E, R, K1846E, R, K1850E, R, K1880R (Ch. 19K20), K2229R, K2258R, K2286R, K2288E (Ch. 19K23)

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DATE 11-52 SET 184 FOLDER 15

PHOTOFACT* Folder

*TRADE MARK

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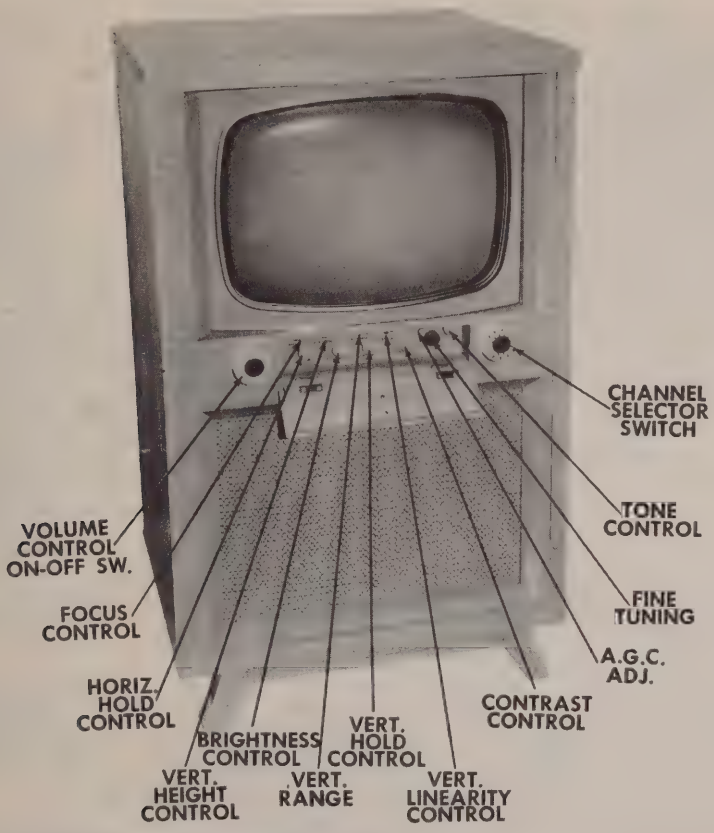

ZENITH K1850E

TRADE NAME	Zenith Model	TV Chassis	Radio Chassis
	K1812E, K1812R	19K22	
	K1815E, K1815R, K1820E		
	K1820R, K1846E, K1846R		
	K1850E, K1850R	19K20	
	K1880R	19K20	8H20Z
	K2229R, K2258R		
	K2286R, K2288E	19K23	
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.		
TYPE SET	Television Receiver		
TUBES	Nineteen		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING	1.7 Amp @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13		

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FOR SERVICE INFORMATION ON RADIO CHASSIS 8H20Z SEE PHOTOFACT SET 168, FOLDER 14.

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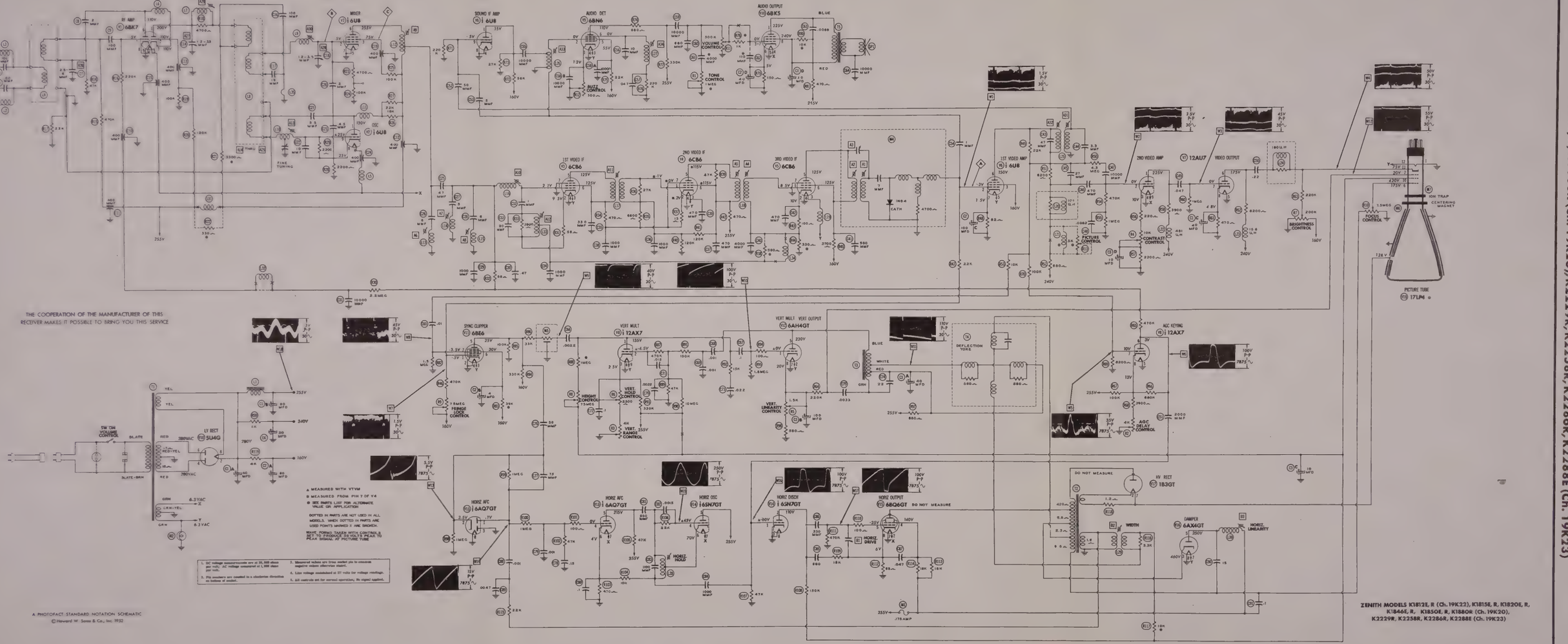
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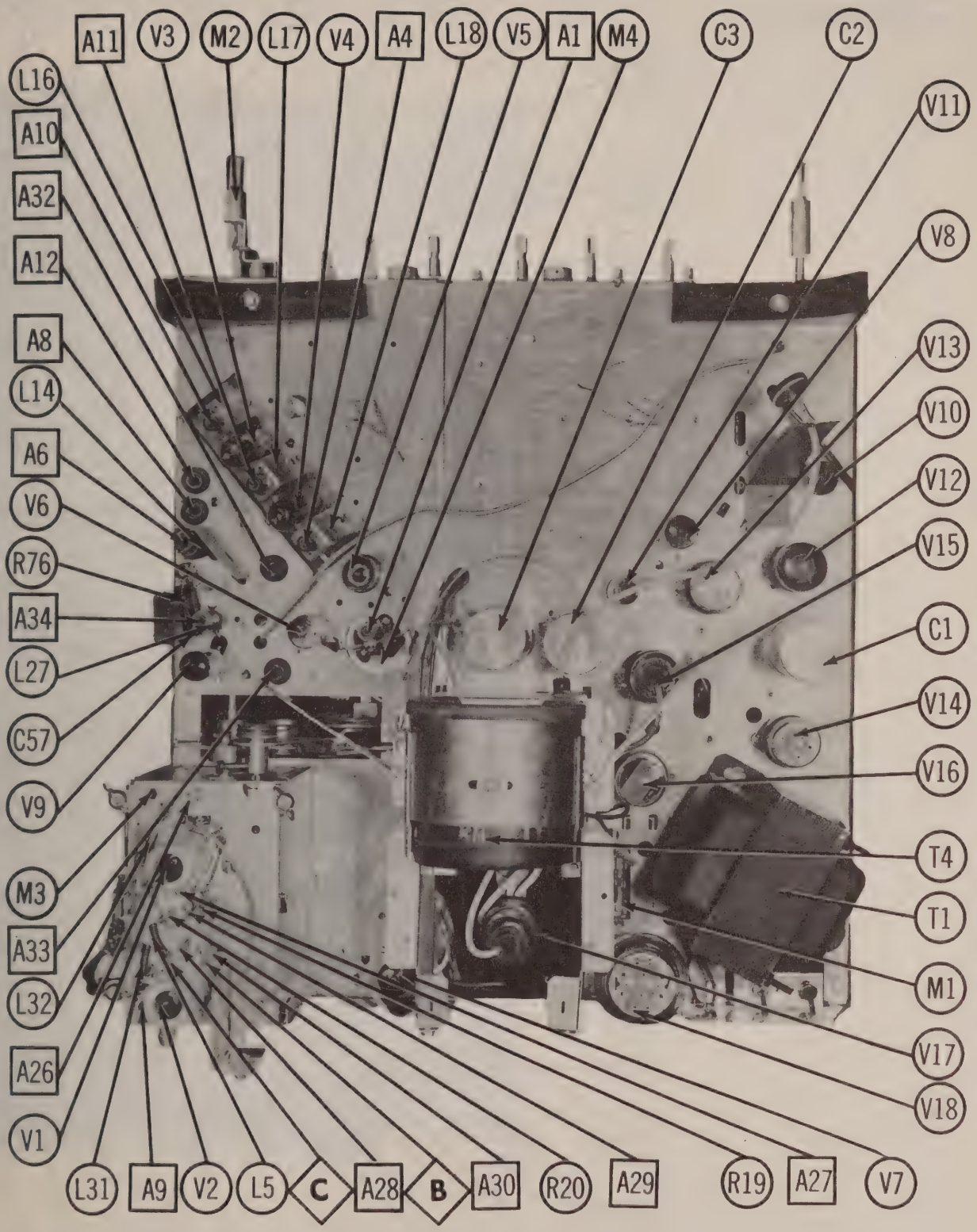

CHASSIS TOP VIEW

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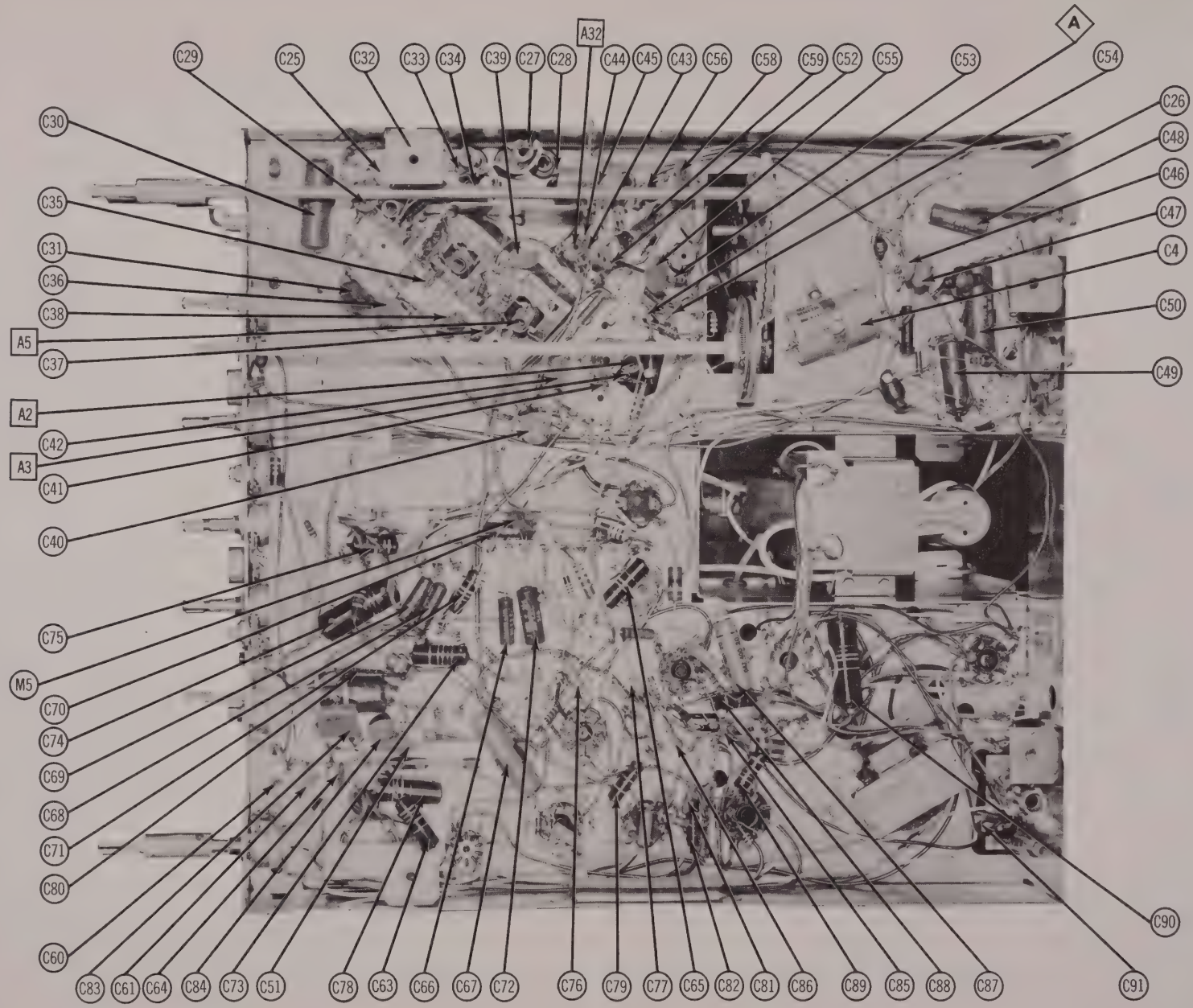

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART

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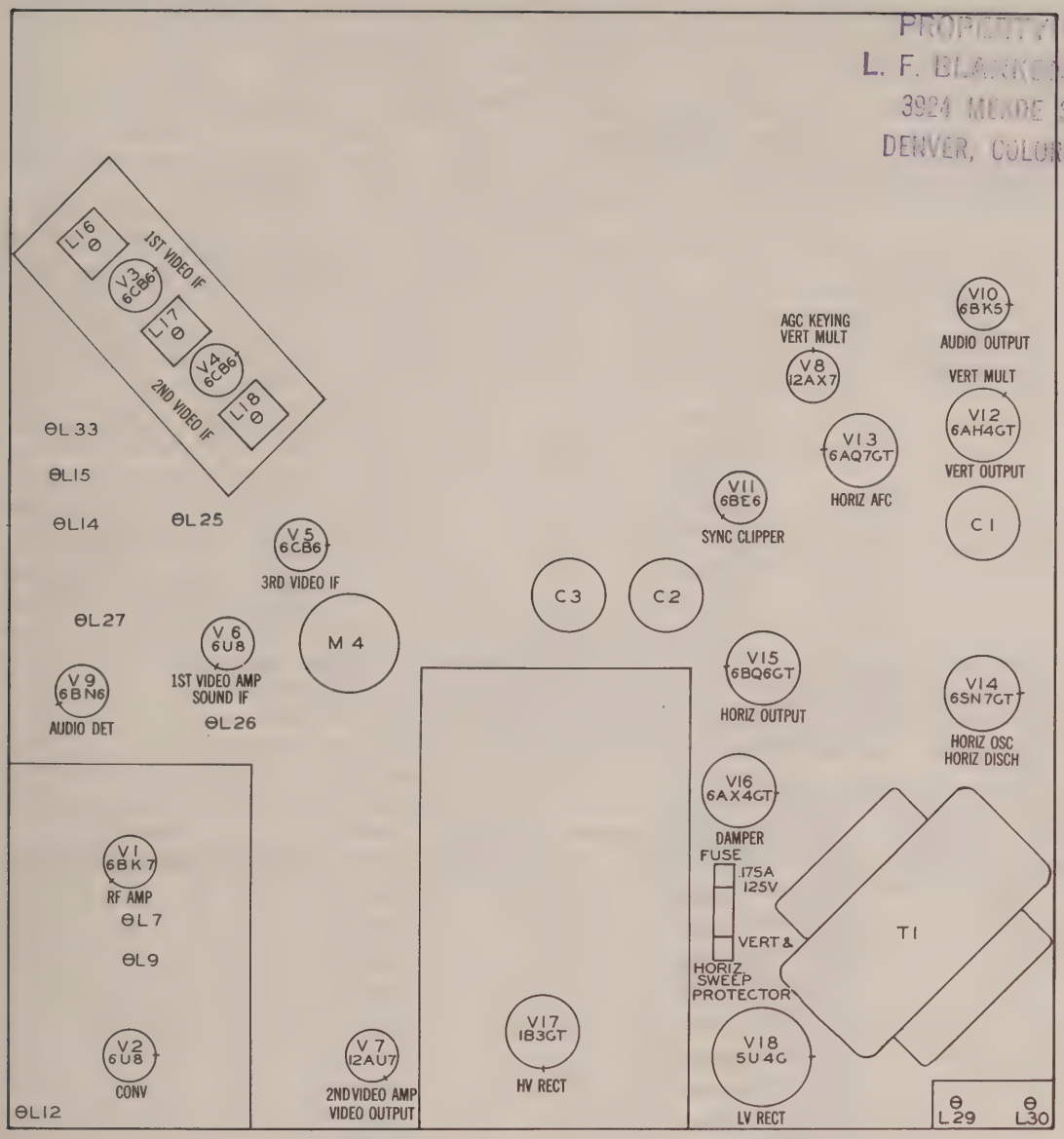


TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, No sound-V18

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V6, V7, V19
Has pic, no sound-V6, V9
Overloaded picture-V8

SYNC FAILURE
No vert. sync. V8, V11
No horiz. sync - V11, V13, V14
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound-V13, V14, V15, V16, V17, V19 Fuse (M1)
No vertical deflection-V8, V12
Poor vert. linearity or foldover-V8, V12
Poor horiz. linearity or foldover-V13, V14, V15, V16
Narrow picture-V13, V14, V15, V16, V17, V18
Vert. off freq. -V 8
Horiz. off freq.-V11, V13, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 2 volt battery to the ungrounded side of C30. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usaully 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	44MC (10MC Swp)	44MC	Any non-interfering channel	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A1, A2, A3	Adjust for curve of maximum amplitude and symmetry similar to fig. 1. A3 is an adjustable coupling "gimmick" which may be rotated with the fingers. Attenuate generator for 2 volts peak to peak on scope.
2.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	"	"	"	"	A4, A5	Preset the bottom slug half way out of coil and the top slug all the way out of coil. Adjust for response similar to fig. 2.
3.	"	High side to point (B). (On top of tuner). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A6, A7, A8	Remove the bias battery and set scope gain to amplify the trap region of the response curve. Adjust for MINIMUM marker amplitude.
4.	"	"	"	42.75MC 45MC 45 75MC	"	"	A9, A10, A11	Replace bias battery. Adjust for response curve similar to fig. 3. If necessary, retouch A1 thru A5 for desired response.
5.	"	"	"	41.25MC 42.75MC 45MC 45.75MC	"	"	A12	Change bias from -2 volts to +3 volts. response should appear as the solid line portion of fig. 4. Adjust A12 for maximum flattening of the 45MC portion of the response as indicated by the dotted lines.
6.	"	"	"	42.75MC 45MC 45.75MC	"	"		Return bias to -2 volts. Check for response as in fig. 3. If necessary, make slight readjustments of A1 thru A5, and A9 thru A11 for desired response.

OSCILLATOR ALIGNMENT

The master oscillator adjustment of A13 is to be made only if adjustment of the individual channel oscillator adjustments fail to bring the channels within the range of the fine tuning control. If channels 2 through 6 fall within the range of the fine tuning control but the higher channels do not, slight adjustment of A13 may bring the higher channels in.
Connect the negative lead of a 1 volt bias supply to the ungrounded side of C30. Connect the positive lead to chassis.
Turn the oscilloscope gain up so that the sound trap notch in the response curve becomes visible.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC Swp)	59.75MC	2	Vert. amp. to point (A). Low side to chassis.	A14	Adjust to place sound marker in notch as in fig. 5.
			63MC (10MC Swp)	65.75MC	3		A15	
			69MC (10MC Swp)	71.75MC	4		A16	
			79MC (10MC Swp)	81.75MC	5		A17	
			85MC (10MC Swp)	87.75MC	6		A18	
			177MC (10MC Swp)	179.75MC	7		A19	
			183MC (10MC Swp)	185.75MC	8		A20	
			189MC (10MC Swp)	191.75MC	9		A21	
			195MC (10MC Swp)	197.75MC	10		A22	
			201MC (10MC Swp)	203.75MC	11		A23	
			207MC (10MC Swp)	209.75MC	12		A24	
			213MC (10MC Swp)	215.75MC	13		A25	

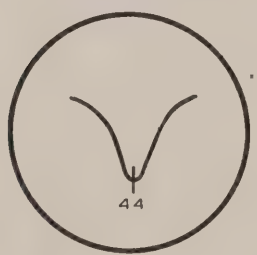


FIG.1

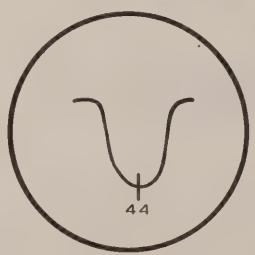


FIG.2

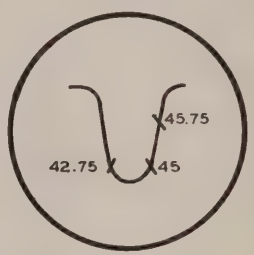


FIG.3

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Leave bias battery connected as under Oscillator Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	61.25MC 65.75MC	3	Vert. amp. thru 10KΩ to point ⟨C⟩ (accessible on top of tuner). Low side to chassis.	A26, A27 A28	Adjust for response curve similar to fig. 6.
9.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A29, A30	Adjust for symmetry of response curve as in fig. 7.

SOUND IF ALIGNMENT

Connect an attenuator (Zenith part #S-17203 or equivalent) in series with the receiver antenna.
Tune in a tone modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 6BN6 limiter-detector, as evidenced by a hiss similar to super-regeneration.
Adjust the sound take-off transformer, (A31 and A32), the Sound IF Coil (A33) and the Quadrature Coil (A34) for maximum sound of best quality.
Adjust the buzz control (R12) for minimum intercarrier buzz.
If the intercarrier buzz cannot be eliminated with the buzz control check the setting of the AGC delay adjustment.
If during the Sound IF Alignment the signal rise above the limiting level (hiss disappears), increase the attenuation until the hiss returns.

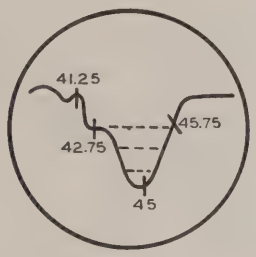


FIG.4

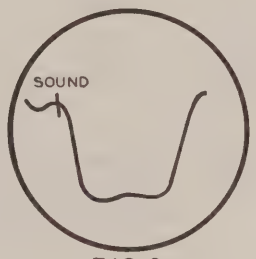


FIG.5

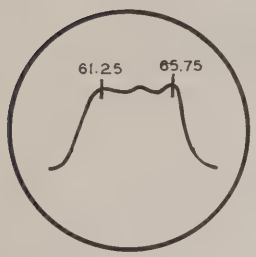


FIG.6

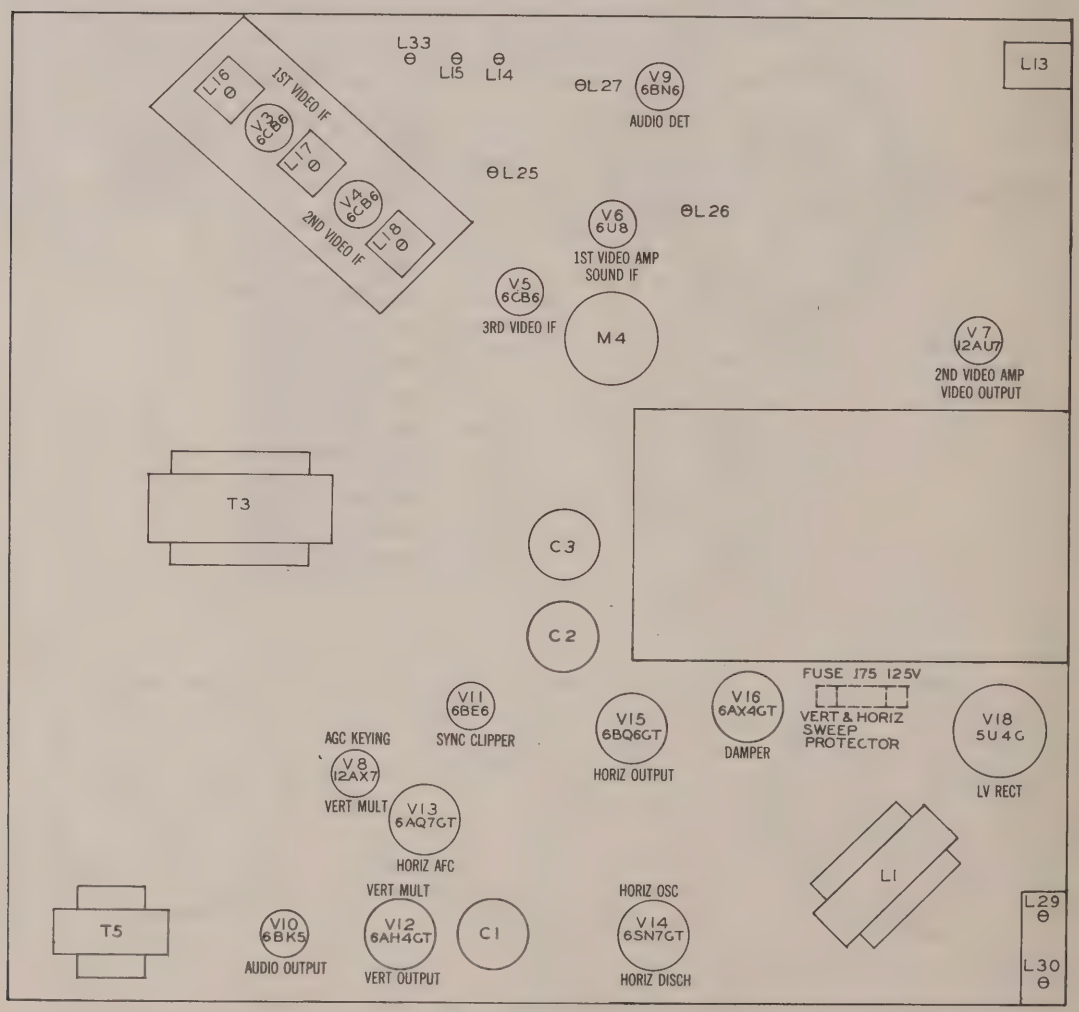
FIG.7

ZENITH MODELS K1812E, R (Ch. 19K22), K1815E, R, K1820E, R, K1846E, R, K1850E, R, K1880R (Ch. 19K20), K2229R, K2258R, K2286R, K2288E (Ch. 19K23)

RESISTANCE MEASUREMENTS

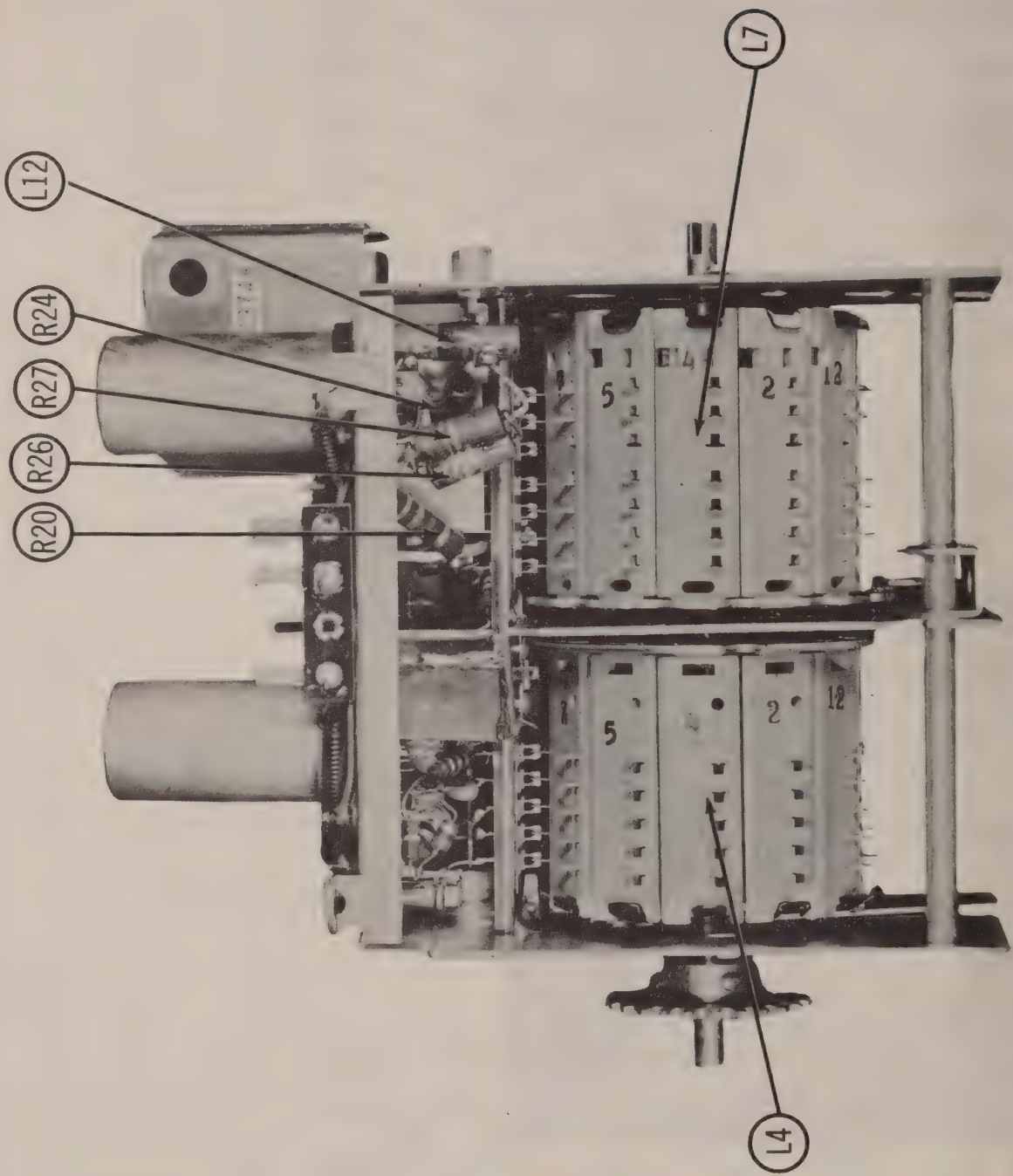
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	†3.4KΩ	55KΩ	INF	0Ω	.1Ω	INF	3.5Meg	0Ω	0Ω
V 2	6U8	†10KΩ	105KΩ	†100KΩ	.1Ω	0Ω	†97Ω	0Ω	2.2KΩ	4.4KΩ
V 3	6CB6	1.1Meg	380Ω	.1Ω	0Ω	65KΩ	65KΩ	0Ω		
V 4	6CB6	60KΩ	65KΩ	.1Ω	0Ω	†567Ω	†567Ω	65KΩ		
V 5	6CB6	330Ω	430Ω	.2Ω	0Ω	†6.7KΩ	†6.7KΩ	0Ω		
V 6	6U8	18KΩ	4.7KΩ	†4KΩ	0Ω	.1Ω	†7.9KΩ	82Ω	0Ω	220KΩ
V 7	12AU7	†5KΩ	1.5Meg	2.7KΩ	0Ω	0Ω	†9.2KΩ	1Meg	470Ω	.1Ω
V 8	12AX7	#4.5Meg	515KΩ	2KΩ	0Ω	0Ω	680KΩ	8.2KΩ	4.7KΩ	.1Ω
V 9	6BN6	250Ω	4.5Ω	.1Ω	0Ω	†26KΩ	220KΩ	†330KΩ		
V 10	6BK5	†1.1KΩ	INF	25KΩ	.1Ω	0Ω	150Ω	25KΩ	†567Ω	INF
V 11	6BE6	24KΩ	0Ω	.1Ω	0Ω	80KΩ	†43KΩ	1.5Meg		
V 12	6AH4GT	1.8Meg	.1Ω	1.8Meg	INF	†1.2KΩ	INF	0Ω	1KΩ	
V 13	6AQ7GT	2Meg	1Meg	0Ω	3Meg	†47KΩ	470Ω	.1Ω	0Ω	
V 14	6SN7GT	47KΩ	#160KΩ	0Ω	32KΩ	†97Ω	10KΩ	.1Ω	0Ω	
V 15	6BQ6GT	INF	.1Ω	15KΩ	†9KΩ	470KΩ	470KΩ	0Ω	68Ω	TOP CAP #9.8Ω
V 16	6AX4GT	1.6Ω	INF	90KΩ	†97Ω	†109Ω	#2.3Ω	.1Ω	0Ω	
V 17	1B3GT	PIN	1 - 8	HAVE	INF	RESISTANCE				TOP CAP #430Ω
V 18	5U4G	INF	15KΩ	†97Ω	16Ω	INF	17Ω	INF	15KΩ	
V 19	17LP4	0Ω	220KΩ	PIN 6 2.4Meg	PIN 10 #10KΩ	PIN 11 310KΩ	PIN 12 .1Ω			

ALL CONTROLS SET FOR NORMAL OPERATION≠ NO SIGNAL APPLIED
† MEASURED FROM PIN 2 OF V18
# MEASURED FROM PIN 3 OF V16

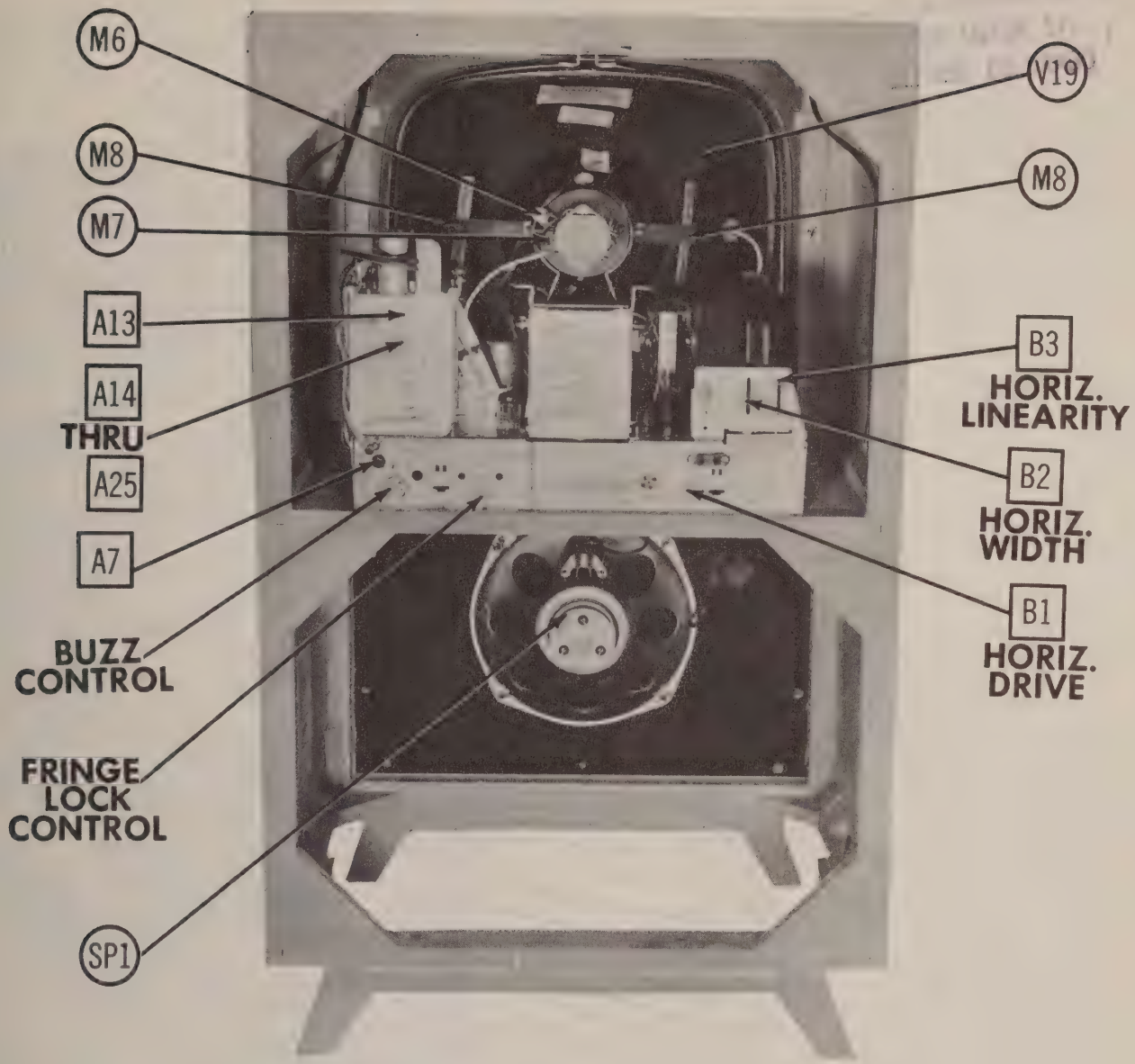


BOTTOM VIEW

TUBE PLACEMENT CHART



RF TUNER

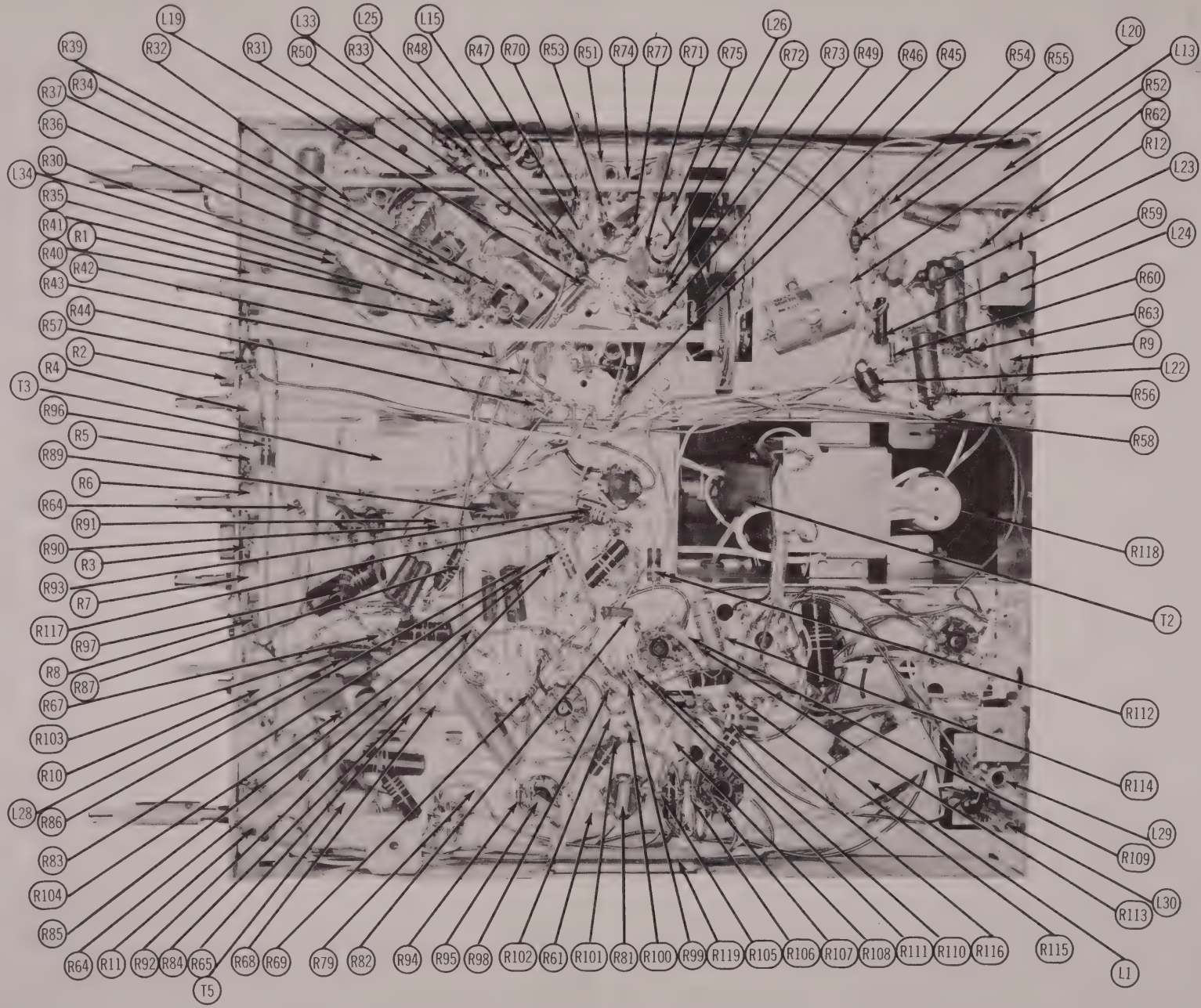


CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

1. Remove 8 push on type control knobs from front panel.
2. Remove 6 wood & 1 metal screws. Remove rear cover.
3. Disconnect built in antenna & speaker.
4. Remove 4 chassis bolts. Remove chassis.
5. Remove 5 wing nuts. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BK7	6BK7	9AJ	
V2	Converter	6U8	6U8	9AE	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	1st. Video Amplfier-Sound IF Amp.	6U8	6U8	9AE	
V7	2nd. Video Amplifier Video Output	12AU7	12AU7	9A	
V8	AGC Keying-Vert. Mult.	12AX7	12AX7	9A	
V9	Audio Detector	6BN6	6BN6	7DF	
V10	Audio Output	6BK5	6BK5	9BQ	
V11	Sync Clipper	6BE6	6BE6	7CH	
V12	Vert. Mult.-Vert. Output	6AH4GT	6AH4GT	8EL	
V13	Horiz. AFC	6AQ7GT	6AQ7GT	8CK	
V14	Horiz. Oscillator-Horiz. Discharge	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V16	Damper	6AX4GT	6AX4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V19A	17LP4	17LP4 17VP4		12C 12C	
B	21FP4A			12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■40	400	22-2358	AFH3-46		UPT84245		FP430.6	TVL-4739	
B	▲80	400		PRS25/50		BR502A		TC77	TVA-1711	
C	40	25								
D	▲30	400								
C2A	▲60	350	22-2418	AFH4-80					TVL-4607	
B	■4	350		PRS350/4						
C	▲100	25		PRS25/50						
D	40	25								
C3A	▲40	400	22-2368	AFH4-132		UPT4145-V10	FP385	FP385	TVL-4822	
B	▲100	50		PRS50/100		BR102A		TC22	TVA-1310	
C	■10	475								
D	10	25								
C4	20	400	22-2389	PRS450/20		BR2045A		TC75	TVA-1709	
C5	100		22-2403							
C6	100		22-2403							
C7	2.5-6		22-2221							
C8	2		22-2434							
C9	100		22-2407							
C10	400		22-2404							
C11	400		22-2404							
C12	400		22-2404							
C13	400		22-2404							
C14	1.2-3.5		22-2405							
C15	400		22-2404							
C16	100		22-2407							
C17	19		22-2406							
C18	1.2-3.5		22-2405							
C19	400		22-2404							
C20	2		22-2412							
C21	5.5		22-2413							
C22	10		22-2411							
C23	4.5		22-2383							
C24	400		22-2404							
C25	470		22-6	SI470	D6-471	5R5T5	GP2K-471	UC-5347	5GA-T47	
C26	6		22-2051				NP0K-060			
C27	5		22-2050	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C28	6		22-2051				NP0K-060			
C29	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C30	.47	200	22-2146	P288-47				PT405	2TM-P47	
C31	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C32	1		22-1762		TCZ-1		NP0K-010		5TCCB-V1	
C33	20		22-2420	SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C34	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	330		22-2309	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C36	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C37	470		22-6	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C38	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C39	470		22-6	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C40	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C41	560		22-2310	SI560	D6-561		GP2K-561	UC-5356	5GA-T56	
C42	470		22-6	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C43	47		22-1876	SI47N080			N080-338-470			
C44	3.3		22-2343	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C45	27		22-1608	SI27	D6-270		GP1K-270	UC-5427		
C46	470		22-6	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C47	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C48	.0082	600	22-2431							
C49	.047	600	22-1844	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C50	.22	400	22-1825	P488-22		PTE4P22		PT4025	4TM-P22	
C51	2000		22-8	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52	50	500	22-1676	1468-00005	D6-500	5W5Q5	GP1K-500	MC325	1FM-45	
C53	5		22-2040	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C54	1		22-1752		TCZ-1		NP0K-010		5TCCB-V1	
C55	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-81	
C56	10		22-1[illegible]	SI10	[illegible]	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C57	.047	200	22-1778	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C58A	10000		22-2778	BPD-01	DD-3-103	TM5DS1	821-01	DC-511	5HK-2S1	
B	10000			BPD-01			821-01	DC-511		
C59	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C60	680		22-1361	SI680	D6-681	2R5T7	GP2K-681	UC-5368	5GA-T68	
C61	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	UC-534	5HK-D4	Note 2
C62	110			SI110			GP2K-111			Note 1
C63	.0068	600	P688-0068		D6-682	PTE6D68	GP2-333-682		6TM-D68	
C64	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C65	.01	600	22-1843	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C66	.0022	600	22-1845	P688-0022		PTE6D22		PT6222	6TM-D22	
C67	.1	600	22-1841	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C68	.001	600	22-1[illegible]	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C69	.001	600	22-1838	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C70	.0022	600	22-1814	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C71	.015	200	22-1850	P288-015		PT6S15			6TM-S15	
C72	.1	200	22-1777	P288-1	DF-104	P72P1		PT401	2TM-P1	
C73	.022	600	22-2[illegible]	P688-022		PTE6S22		PT6122	6TM-S22	
C74	.22	200	22-1567	P488-22		PTE4P22		PT4025	2TM-P22	
C75	.0033	600	22-1748	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D3	
C76	56	500	22-1831							
C77	75	500	22-1252	1469-000075				MCB230		
C78	.15	200	22-2166	P288-15		PTE4P15			2TM-P15	
C79	.001	600	22-2127	P688-001	D6-102	PTE6D1	GP1L-102	PT621	6TM-D1	
C80	.1	200	22-1777	P288-1	DF-104	P72P1		PT401	2TM-P1	
C81	680		22-2[illegible]	SI680	D6-681	2R5T7	GP2K-681	UC-5368	5GA-T68	
C82	.0015	400	22-1785	P688-0015		PTE6D15			6TM-D15	
C83	1100	500	22-1[illegible]							
C84	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C85	680		22-2387	SI680	D6-681	2R5T7	GP2K-681	UC-5368	5GA-T68	
C86	330		22-1[illegible]	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C87	.047	400	22-1775	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C88	.001	600	22-2127	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C89	.0047	400	22-1842	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C90	.15	400	22-2341	P488-15		PTE4P15			4TM-P15	
C91	.1	400	22-2340	P488-1		PTE4P1		PT401	4TM-P1	
C92	7		22-1874	SI6.8NP0	TCZ-6.8		NP0K-070	ZT-5568	5TCCB-V68	

Note 1. Not used on all Models.
Note 2. Not used on Ch.19K22.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	[illegible]	QU-137	AG-61-S	AB-69	U-54	Tone - See Note 1
B	Shaft		Not Req.	Not Req.	[illegible]	AK-4	Not Req.	Attach to R1A, AGC Delay-Wire Wound
R2	4000Ω	1	63-2159					Vert. Range -Wire Wound
R3	4000Ω	1	63-2159					Contrast-See Note 2
R4A	10KΩ	½	63-2780	QI4-116	AG-30-V	AB-17	U-19	Attach to R4A
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Vert. Linearity
R5A	1500Ω	½	63-2815	QU-110	AG-11-S	AB-6	U-6	Attach to R5A
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Vert. Hold
R6A	2500Ω	½	63-2795	QU-112	AG-15-S	AB-7	U-8	Attach to R6A
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Brightness-Note 2
R7A	200KΩ	½	63-2779	QU-129	AG-52-S	AB-46	U-43	Attach to R7A
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Height
R8A	7.5Meg	½	63-2394			AB-89		Attach to R8A
B	Shaft		Not Req.			AK-1		Fringe Lock
R9A	7.5Meg	½	63-2805			AB-89		Attach to R9A
B	Shaft		Not Req.			AK-1		Focus
R10A	7.5Meg	½	63-2805			AB-89		Attach to R10A
B	Shaft		Not Req.			AK-1		Volume-See Note 3
R11A	500KΩ	½	63-2777	QI3-137	AG-60-Z	BSK-60-S	U-48	Attach to R11A
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R11A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Buzz-Wire Wound
R12	500Ω	1	63-2050					Picture-See Note 4
R13	5000Ω		63-2824					

Note 1. Tone control omitted in Ch. 19K22.
Note 2. Combined to form dual concentric (Part #63-2825) in Ch. 19K23.
Note 3. In Ch. 19K23 Volume Control & Sw. changed. (Part #63-2804)
Note 4. Used only in Ch. 19K23.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	NOTES
R14	47KΩ	½	63-1856		
R15	470KΩ	½	63-1897		
R16	220KΩ	½	63-1884		
R17	22KΩ	½	63-1842		
R18	4700Ω	½	63-1813		
R19	100KΩ	½	63-1869	BTS-100K	
R20	120KΩ	½	63-1873	BTS-120K	
R21	3300Ω	1	63-1974		Note 1
R22	330Ω	½			Note 8
R23	4700Ω	½	63-1814		
R24	100KΩ	½	63-1869		
R25	100KΩ	½	63-1869		
R26	18KΩ	1	63-2807	BTA-18K	
R27	22KΩ	1	63-958	BTA-22K	
R28	2200Ω	½	63-1799		
R29	2200Ω	½	63-1799		
R30	2.2Meg	½	63-1926	BTS-2.2Meg	
R31	56Ω	½	63-1733		
R32	68Ω	½	63-1737		
R33	3900Ω	½	[illegible]	BTS-3900	
R34	470Ω	½	63-1772	BTS-470	
R35	6800Ω	½	63-1820	BTS-6800	
R36	27KΩ	½	63-1845	BTS-27K	
R37	15Ω	½	63-1708		
R38	560Ω	½	63-1775	BTS-560	Note 9
R39	47KΩ	½	63-1855		
R40	120KΩ	½	63-1873	BTS-120K	
R41	120KΩ	½	63-1873	BTS-120K	
R42	470Ω	½	63-1771	BTS-470	
R43	100Ω	½	63-1743	BTS-100	
R44	330Ω	½	63-1764	BTS-330	Note 2
R45	2700Ω	1	63-1566	BTA-2700	
R46	470KΩ	½	63-1898	BTS-470K	
R47	22KΩ	½	63-1841	BTS-22K	
R48	82Ω	½	63-1740	BTS-82	
R49	22KΩ	½	63-1841	BTS-22K	
R50	4.3Meg-5%	½	63-1837	BTS-4.3Meg-5%	
R51	6200Ω-5%	2	63-1579	BTB-6200-5%	
R52	620Ω-5%	½	63-1777	BTS-680-5%	
R53	10KΩ	½	63-1828	BTS-10K	
R54	470KΩ 5%	½	63-1896	BTS-470K-5%	
R55	1Meg	½	63-1911	BTS-1Meg	
R56	220Ω	½	63-1757	BTS-220	
R57	2200Ω	½	63-1799	BTS-2200	
R58	3900Ω	½	63-1810	BTS-3900	
R59	1000Ω	½	63-1788	BTS-1000	
R60	1Meg	½	63-1912	BTS-1Meg	
R61	470Ω	½	63-1771	BTS-470	
R62	8200Ω	2	63-1101	BTB-8200	
R63	220KΩ	½	63-1883	BTS-220K	
R64	220KΩ	½	63-1883	BTS-220K	
R65	470KΩ	½	63-1898	BTS-470K	
R66	680KΩ	½	63-1904	BTS-680K	
R67	100KΩ	2	63-1982	BTB-100K	
R68	3900Ω	½	63-1810	BTS-3900	
R69	8200Ω	½	63-1824	BTS-8200	
R70	100KΩ	½	63-1869	BTS-100K	
R71	220KΩ	½	63-1883	BTS-220K	
R72	56KΩ	½	63-1859	BTS-56K	
R73	27KΩ	½	63-1845	BTS-27K	
R74	680Ω	½	63-1778	BTS-680	
R75	22KΩ	1	63-1055	BTA-22K	
R76	220KΩ	½	63-1883	BTS-220K	
R77	330KΩ	½	63-1890	BTS-330K	
R78	1000Ω	½	63-1786	BTS-1000	Note 3
R79	150Ω	½	63-1750	BTS-150	
R80	10KΩ	½	63-1828	BTS-10K	Note 4
R81	470Ω	1	63-2398	BTA-470	
R82	1.5Meg	1		BTA-1.5Meg	
R83	39KΩ	1	63-1188	BTA-39K	Note 5
R84	330KΩ	½	63-1890	BTS-330K	
R85	100KΩ	½	63-1869	BTS-100K	
R86	33KΩ	1		BTA-33K	
R87	470KΩ	½	63-1897	BTS-470K	
R88	1Meg	½	63-1911	BTS-1Meg	Note 6
R89	47KΩ	½	63-1855	BTS-47K	
R90	10Meg	½	63-1953	BTS-10Meg	
R91	100KΩ	½	63-1869	BTS-100K	
R92	15KΩ	½	63-1834	BTS-15K	
R93	330KΩ	1		BTA-330K	
R94	100Ω	½	63-1744		
R95	1.8Meg	1	63-1922	BTA-1.8Meg	
R96	560Ω 5%	1		BTA-560-5%	
R97	680Ω	1	63-2290	BTA-680	
R98	1Meg	½	63-1911	BTS-1Meg	
R99	1Meg	½	63-1911	BTS-1Meg	
R100	1Meg	½	63-1911	BTS-1Meg	
R101	100Ω	½	63-1744		
R102	47KΩ	½	63-1855	BTS-47K	
R103	470Ω	½	63-1771	BTS-470	
R104	10KΩ	2	63-1198	BTB-10K	
R105	47KΩ	1	63-1194	BTA-47K	
R106	22KΩ	½	63-1842	BTS-22K	
R107	47KΩ	½	63-1856	BTS-47K	
R108	150KΩ	½	63-1876	BTS-150K	
R109	15KΩ	1		BTA-15K	
R110	100Ω	½	63-1744		
R111	470KΩ	½	63-1898	BTS-470K	
R112	68Ω	2	63-2808	BW-2-68	
R113	18KΩ	2	63-2364	BTB-18K	
R114	18KΩ	2	63-2364	BTB-18K	
R115	22KΩ	1	63-958	BTA-22K	
R116	3300Ω	2	63-1970	BTB-3300	
R117	10KΩ	½	63-1827	BTS-10K	Note 7
R118	1.2Ω	½	63-2129		
R119	4000Ω	10	63-2794	13/4A-4000	

Note 1. Some Models use a 2700Ω (1 Watt) resistor in this application.
Note 2. Some Models use a 180Ω resistor in this application.
Note 3. Not used in all models.
Note 4. Added for radio & TV combinations only.
Note 5. Some Models use a 27KΩ (1 Watt) resistor in this application.
Note 6. Some Models connect a 1Meg resistor in series with vert. size control and plate of vert. MV.
Note 7. Some Models use 33KΩ resistor in this application.
Note 8. Some Models replace R22 with coil L31.
Note 9. Some Models replace R38 with coil L34.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC	560 VCT	5VAC	6.3VAC @ 4.5A SEC. 4	95-1298				
	@ 1.7A	.250ADC	@ 3A	6.3VAC @ 4.8A					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	441.6	1.6Ω	S-18567					Horiz. Output Trans.
	tap @ 9.5Ω, 11.8Ω, 21.6Ω	SEC. 2 0Ω						
T3	399Ω tap @ 29Ω 39Ω		95-1309					Vert. Output Trans.
T4A	16Ω		95-1297E	DY-9	MDF-70	TY-3	Y-17	Horiz. Deflection Coils
B	48Ω		95-1297 ①					Vert. Deflection Coils

① Alternate deflection yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T5	6.66KΩ	3.6Ω	550Ω	.66Ω	95-1294	A-3878 ①	A-2931 ①	RO-13 ①	S-7X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.6Ω	49-649 49-719 ① 49-696 ② 49-704 ③	ST-119 Mod. P10-T	10A31	① Alternate 4" PM speaker ② Alternate 5 1/4" PM Speaker ③ Alternate 12" PM speaker

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.225A	97Ω	3Hy.	95-1280		C-2994 ①	[illegible]	[illegible]

① Drill one new mtg. hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MERIT PART No.	NOTES
L2	FM Trap	0Ω		S-18858		
L3	FM Trap	0Ω		S-18858		
L4	Ant. Coil	0Ω		S-18860		Channel 2
L5	Fil. Choke	0Ω				
L6	Neutralizing Coil	0Ω				
L7	RF Plate Coil	0Ω				
L8	RF, Mixer Grid & Osc. Coils	0Ω		S-18872		Channel 2
L9	Mixer Grid Coil	0Ω				
L10	Osc. Grid Coil	0Ω				
L11	Osc. Plate Coil	.7Ω				
L12	Converter Plate	3Ω		S-18857		
L13	Sound Carrier Trap	0Ω		S-18209		
L14	Adj. Channel Picture Trap	0Ω		S-18744		
L15	Adj. Channel Sound Trap	0Ω		S-18210		
L16	1st. Video IF	.1Ω		S-18589		
L17	2nd. Video IF	.1Ω	.1Ω	S-17907		
L18	3rd. Video IF	.2Ω	.1Ω	S-18730		Less shield & lug assembly, part #S-18741
L19	Fil. Choke	.1Ω		S-16984		
L20	Series Peaking Coil	4.5Ω		S-18727	TV-181	100 Microhenries
L21	Series Peaking Coil			S-17343		Not used in all models.
L22	Shunt Peaking Coil	13Ω		S-17958	TV-188	481 Microhenries
L23	Shunt Peaking Coil	22Ω		S-18749		15.6 Microhenries
L24	Series Peaking Coil	6.2Ω		S-18750	TV-184	180 Microhenries
L25	1st. Sound IF	2Ω	3.7Ω	S-18568		Tapped @ 2.7Ω & 4.6Ω
L26	2nd. Sound IF	5.5Ω		S-19006		
L27	Quadrature Coil	5Ω		S-19001		Tapped @ 95Ω
L28	Horiz. Osc.	150Ω		S-17114		
L29	Width Coil	17Ω	2Ω	S-18748		
L30	Horiz. Lin.	12Ω		S-18570	MWC-2	
L31	RF Choke	0Ω				Some models use 330Ω resistor, R22
L32	Grid Choke	0Ω				Not used in all Models.
L33	Cathode Trap	.1Ω		S-19002		Less coil shield & lug assembly, part #S-19003
L34	RF Choke	1.5Ω				Not used in all Models.
L35	Mixer Grid Coil	0Ω				

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	.175A 125V	136-21	83-1883	313.175	357001	MDL-175/1000	4405

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ZENITH PART No.	NOTES
M2	Bayonet	6-8	.15	Brown	100-67	Type #47

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	RF Tuner	S-18770	
M4	4th. Video IF Capacitor	22-1874	7MMF
	Crystal	103-1	1N64
	Peaking Coil	S-17911	Video Det. Assy. Part #S-18590
	Peaking Coil	S-18751	Wound 4.7KΩ resistor
	Peaking Coil	S-1528	
M5	Integrator Unit	87-1	
M6	Centering Magnet	S-18439	
M7	Ion Trap	S-17164	
M8	Magnets	S-18763	Anti-pin cushion correctors (2 required)

PROPERTY OF [illegible]

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS (CONT.)

ITEM No.	PART NAME	ZENITH PART No.	NOTES
B1	Trimmer	22-2398	Horiz. Drive
	Ant. Coil Assy.	S-18861	Channel #3
	Ant. Coil Assy.	S-18862	Channel #4
	Ant. Coil Assy.	S-18863	Channel #5
	Ant. Coil Assy.	S-18864	Channel #6
	Ant. Coil Assy.	S-18865	Channel #7
	Ant. Coil Assy.	S-18866	Channel #8
	Ant. Coil Assy.	S-18867	Channel #9
	Ant. Coil Assy.	S-18868	Channel #10
	Ant. Coil Assy.	S-18869	Channel #11
	Ant. Coil Assy.	S-18870	Channel #12
	Ant. Coil Assy.	S-18871	Channel #13
	Osc. Coil Assy.	S-18873	Channel #3
	Osc. Coil Assy.	S-18874	Channel #4
	Osc. Coil Assy.	S-18875	Channel #5
	Osc. Coil Assy.	S-18876	Channel #6
	Osc. Coil Assy.	S-18877	Channel #7
	Osc. Coil Assy.	S-18878	Channel #8
	Osc. Coil Assy.	S-18879	Channel #9
	Osc. Coil Assy.	S-18880	Channel #10
	Osc. Coil Assy.	S-18881	Channel #11
	Osc. Coil Assy.	S-18882	Channel #12
	Osc. Coil Assy.	S-18883	Channel #13
	Knob	S-19283	Channel Selector & Disc. Assy. — Models K1850E, K1812E, K1820E, K1815E, K1846E & K2288E
	Knob	S-19285	Off/On Volume — Models K1850E, K1812E, K1820E, K1815E, K1846E & K2288E
	Knob	S-19282	Channel Selector & Disc. Assy. — Models K1850R, K1812R, K1820R, K1815R, K1880R, K1846R, K1858R, K1880R & K2286R
	Knob	S-19284	Off/On Volume — Models K1850R, K1812R, K1820R, K1815R, K1880R, K1846R, K1858R, K1880R & K2286R
	Knob	46-896	Brightness, Contrast, Vert. Hold & Tone — Models K1812R K1812E, K1820R, K1815R, K1850R, K1850E, K1820E, K1815E, K1846R, K1846E
	Knob	46-1011	Fine Tuning — Models K1812R K1812E, K1820R, K1815R, K1850R, K1850E, K1820E, K1815E, K1846R, K1846E
	Knob	46-887	Horiz. Hold — Models K1812R K1812E, K1820R, K1815R, K1850R, K1850E, K1820E, K1815E, K1846R, K1846E
	Knob	46-1003	Horiz. Hold — Model K2258R
	Knob	46-1005	Vert. Hold & Tone — Model K2258R
	Knob	46-1052	Fine Tuning — Model K2258R
	Knob	46-1017	Brightness — Model K2258R
	Knob	46-1018	Contrast — Model K2258R
	Back Cover	S-19043	Models K1850R, K1850E
	Back Cover	S-18917	Models K1820E, K1820R, K1812R, K1812E, K1815R, K1815E
	Back Cover	S-19236	Models K1846R, K1846E
	Back Cover	S-19196	Model K1880R
	Back Cover	S-19096	Model K2258R

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B1) for greatest picture width.

Adjust the width slug, (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug, (B3) for a picture that is symmetrical from left to right.

FRINGE LOCK ADJUSTMENT

Turn the fringe lock control to 1/4 turn from full clockwise position. Adjust the vertical and horizontal hold for picture synchronization and check stability by switching off channel and back again. Slightly retouch the fringe lock control adjustment, if necessary, for maximum stability while testing as above.

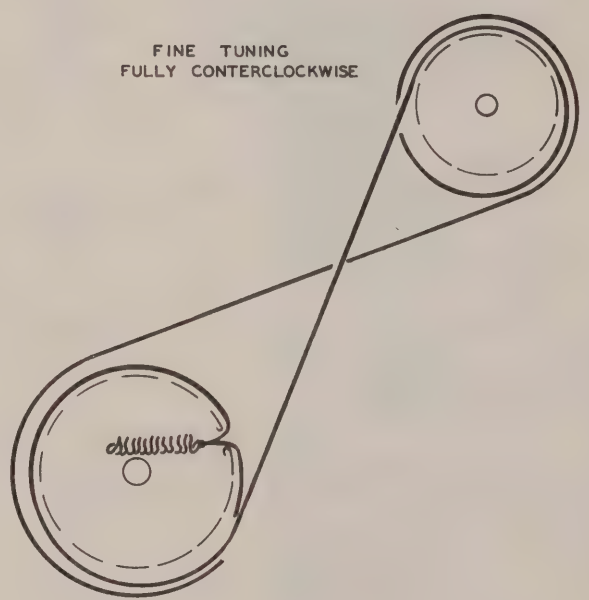
CORRECTOR MAGNET ADJUSTMENT

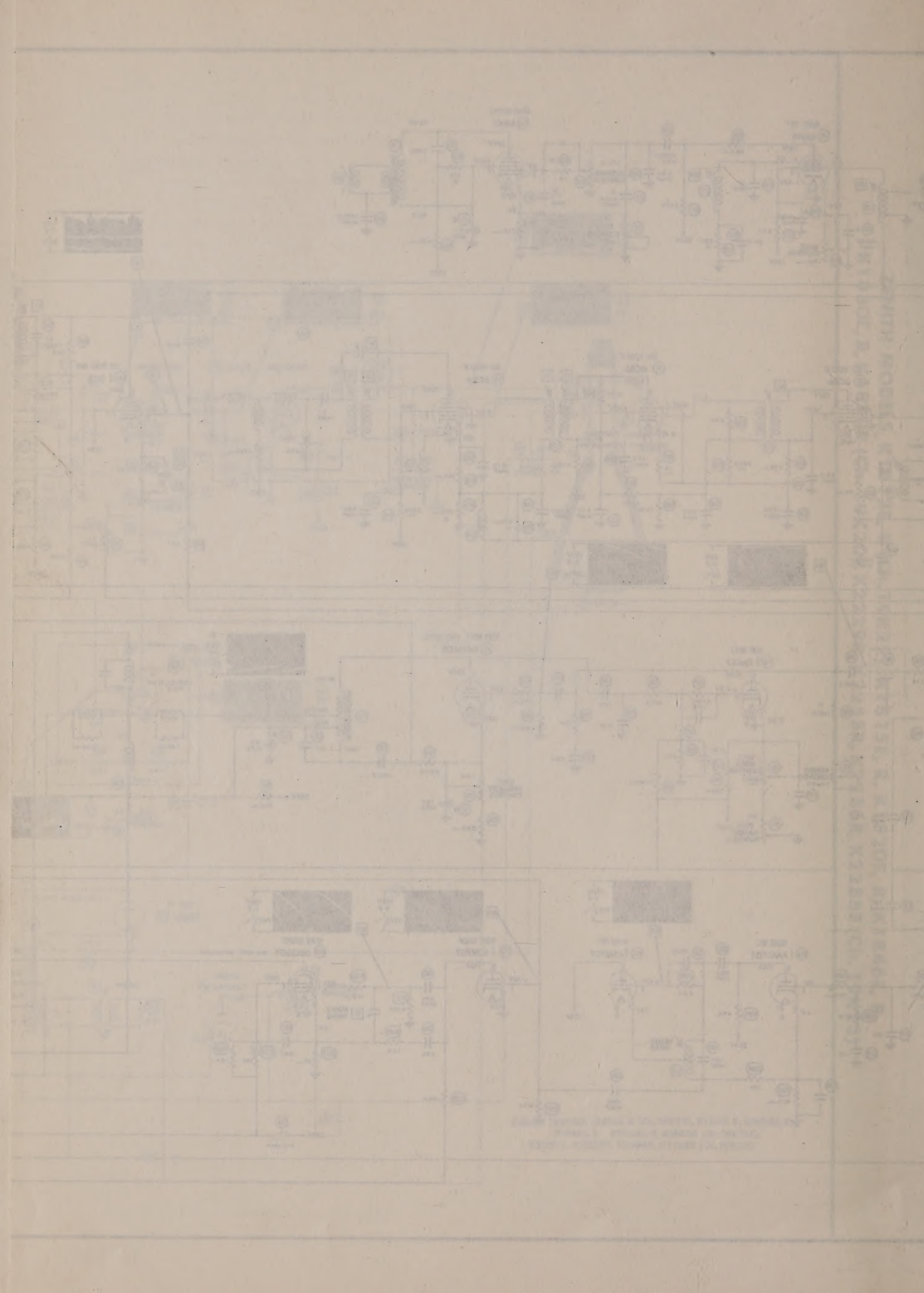
Adjust the vertical and horizontal size controls so that the corners and sides of the picture are visible.

Bend the corrector magnet arms for right angle corners and until oppositie sides of the picture are parallel and straight. Restore the picture to normal size.

AGC DELAY CONTROL ADJUSTMENT

Connect the vertical amplifier of an oscilloscope through 10KΩ to point (A). Select the strongest TV signal available and adjust the delay control for 2 volts peak output.



FINE TUNING DRIVE CORD STRINGING

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